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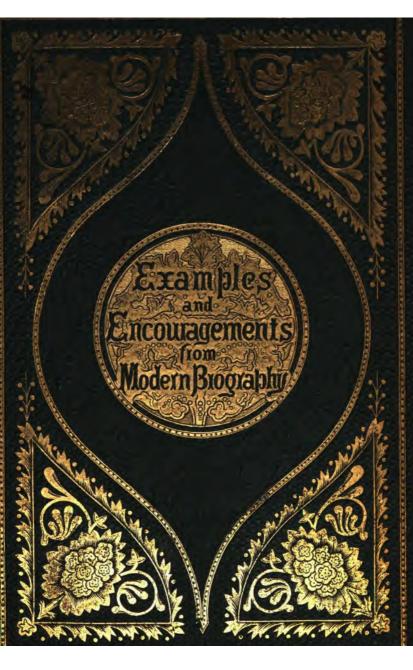
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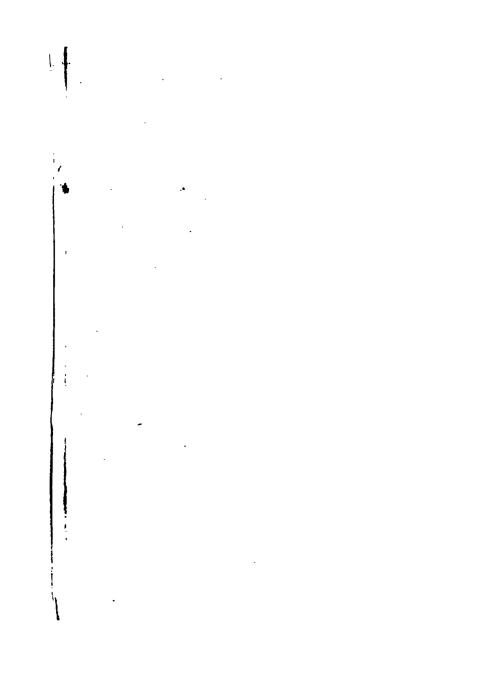
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THE STEADY AIM:

A BOOK OF

Examples and Encouragements from Modern Biography.

BY

W. H. DAVENPORT ADAMS,

AUTHOR OF

'MEMORABLE BATTLES IN ENGLISH HISTORY,'
'MEN AT THE HELM,' 'THE SEA-KINGS OF ENGLAND,'
ETC. ETC.

Rich are the diligent, who can command Time, Nature's stock, and, could his hour-glass fall, Would, as for seed of stars, stoop for the sand, And, by incessant labour, gather all.

SIE W. DAVENANT.

ILLUSTRATED.

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WORK AND PURPOSE.

So shall inferior eyes
That borrow their example from the great,
Grow great by your example, and put on
The dauntless spirit of resolution.

SHAKSPEARE.



PREFACE:

Much more profitable and gracious is doctrine by ensample than by rule.—EDMUND SPENSER.

I have brought together in the following pages some notable examples, principally selected from English Biography, of men who have become great by their adoption of a particular path in life, and their following up that path with an energy which never relaxed, and a resolution which never faltered.

It seems to me that the cardinal defect of modern educational systems is, that they demand too much from their victims; that they bind down the weary brain to the study of half a dozen isms and a score of ologies, until a smattering is obtained of many branches of knowledge, but a profound acquaintance with none. Now-adays, we produce few scholars, but a host of elaborate little dunces!

The error of our boyhood, however, becomes the curse of our manhood. Unable to select any special vocation as that for which they have been fitted by a special training, our young men enter upon life without a definite object, and waste it as triflers, or struggle through it as plodders. The heart without a hopeful aspiration must necessarily grow cold and dreary; the mind without a healthy ambition will soon become dwarfed to little things; and blank and cheerless, indeed, must be the existence—miserably profiless the career—of a man without a purpose.

I have endeavoured in the present volume to encourage

vi PREFACE.

my young readers in the adoption of one favourite pursuit, by showing what signal success has invariably rewarded the worker of steady aim and unflinching will. I have sought to point out that a high degree of excellence may always, and no small share of worldly advantage may often, be secured by students of limited abilities, if they will labour earnestly, and direct their labours to the accomplishment of a particular end. I have desired to illustrate the force of the venerable adage that 'Patience and perseverance will, sooner or later, overcome every difficulty;' and to show that obstacles vanish before the clear intellect and bold heart, like snow-drifts before the searching wind and genial sun. These truths are trite enough, I admit; but there are some truths which cannot be too frequently repeated, if we would have them take root in the heart of Youth and flourish.

In composing the Biographical portion of the following pages, I have kept constantly in view the object that originated them, and in each eminent life have singled out those incidents which seemed to me best calculated to subserve that object. When discoursing upon Watt, and Arkwright, and Wedgwood, it is almost impossible to say aught that is new; but as, in every instance, I have consulted the latest authorities, many details will be found introduced which are not usually met with in similar Meanwhile, may the 'purpose' of this little volume commend it to the favourable notice of press and public! May its Examples and Encouragements influence for good, and inspire with honourable aims, the minds of my boy-readers—stimulating them to lead lives of noble exertion, unremitting industry, and sublime endurance! Worldly success, it is true, may not always be their reward; but—as the poet tells us—

The virtue lies
In the STRUGGLE — not the PRIZE.

W. H. D. A.

DENMARK HILL, 1863.

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THE STEADY AIM.

CHAPTER I.

EXAMPLES AND ENCOURAGEMENTS FROM THE LIVES OF EMINENT INVENTORS AND DISCOVERERS.

Never yet was good accomplish'd Without hand and thought. BARRY CORNWALL.

PROLOGUE.

- 1. It is fitting that every man, however humble his condition, should set before himself, at the outset of his career, some object to be attained, some desire to be gratified, or some hope to be fulfilled. And it is the design of this volume to show, by examples from modern Biography, that if he resolutely adhere to the purpose thus defined, and steadfastly carry out his Steady Aim, his exertions, sooner or later, will be crowned with success.
 - 2. And success—success in life—is equally dear to the philanthropist as to the statesman, to the artist in his studio as to the captain who would bind his brow with 'War's red laurels.' For we would be understood by 'success in life' to mean not only material, but, if we may use the expression, moral success—a success not to be appraised by any worldly standard. Let the student declare that by

success in life he means the acquirement of extensive Let the savant protest that it consists in the felicitous investigation of scientific mysteries. Let the poet assert that it is a noble place on the bead-roll of those sublime singers whose music 'vibrates in the memory' of successive generations. The engineer shall limit his ambition to the perfection of some wonderful mechanism, or the development of one of those inventions which help man to subdue nature. The merchant shall freight his ships with the treasure of far-off lands; and the man of letters be content if he secure a fitting audience for what he has to say. Thus, success in life may be rightly comprehended by each of us to mean the fruition of our special labours; and the philosopher may justly rejoice in the hopes fulfilled, and designs accomplished, upon which the soldier would look down with undisguised contempt. Or the studious bookworm, who barely earns a sufficient pittance to afford the frugal meal by day and the needful oil at night, may fold himself in his virtuous contentment as in a cloak, and feel, in the noble pride of knowledge, that no condition can surpass, no 'success in life' can equal his!

- 3. But how is that success to be attained? How shall we realise those burning dreams which set our young hearts astir with anxiety, and move our brains into ceaseless action? Yonder shine the Golden Gates which open into the Enchanted Land, but a dreary waste of cloud and shadow, concealing we know not what of insuperable difficulties or hostile terrors, intervenes between them and us. How shall we run the race? How shall we fight the battle? Whither shall we turn for aid, advice, or consolation?
- 4. Let the young neophyte, thus trembling on the threshold of an uncertain Future, turn to Biography for the help he needs. Every great and good life is rich in necessary warning, in hopeful promise. Most illustrious men have owed the inspiration which spurred them on to excellence to the perusal of what other men have suffered and achieved. Sir Samuel Romilly speaks of the influence exercised upon

him by the biography of the French statesman, Daguesseau. 'It excited to a great degree,' he says, 'my ardour and ambition, and opened to my imagination new paths of glory.' The life of Robert Hall has stirred many young hearts like the sound of a trumpet; and how many a gallant soul has been warmed into heroism by the career of Nelson! Alfieri became a poet through reading Plutarch, and Luther was made a Reformer by the life of John Huss. In the weighty pages of Biography you shall see how others have endured, and enduring triumphed; how through doubt, and danger, and suffering, the strong heart has worked its way to its goal at last; how the faltering brain and craven soul have gone down in life's battle, unheeded and unknown. For one's entrance into the world resembles one's entrance into a crowded mart, or a thickly-peopled arena. The throng presses forward, resistless and defiant. Hold your own; keep your footing firmly; waver neither to the right hand nor the left; and you are safe. Soon, secure and exultant, you will gain admission into the charmed circle; you will win 'success in life.' But falter ever so little, and you will be flung down by the remorseless crowd, which tramples you beneath its myriad feet as it presses onward to its desired goal. So the sea soon engulfs the swimmer, if he relax in his exertions, or bate one jot of heart and hope.

The eternal surge
Of time and tide rolls on, and bears afar
Our bubbles.

5. From the lives of certain great and good men we now propose to furnish our young readers with some examples and encouragements, calculated to assist and console them in their endeavours to grapple with the world, and overcome it. We propose to point out the 'footprints on the sands of Time' made by those heroic men, whose names the world will not willingly let die; to show how from these enduring marks of a continual progress the heart may derive both hope and inspiration. For 'success in life' can only be secured by a resolute devotion of our energies to a particular object; by the entire concentration of our powers

upon one steadfast aim. The 'bull's-eye' may not be hit by the rifleman whose hand is uncertain, and his footing infirm. The goal will never be reached by the runner who swerves from a straight course, and wanders into a pathless The student will accomplish nothing who wilderness. flies from study to study with the restlessness of disease; and no man, whatever his condition or his mental powers, will win or deserve success, unless he fixes upon some special object to be carried out, and through cloud and sunshine steadily perseveres in his settled purpose. It is Purpose, indeed, which is the very essence—the main element-of an heroic character. It was Purpose which animated Ignatius Loyola in his ascetic labours; in persecution, and captivity, and physical suffering, still toiling at the fulfilment of his cherished design, the establishment of that 'Society of Jesus' whose influence on the world's history has been so signal and remarkable. Martin Luther's 'purpose' achieved the Reformation. Oliver Cromwell's 'purpose' turned the tide of battle at Naseby, and placed him in the seat of the English Kings. Mahomet's 'purpose' built up a mighty empire, and fixed the firm foundations of a new creed. The man who concentrates his energies upon the fulfilment of an unalterable design will assuredly wring success from the hands of a reluctant Fortune. a man will take no heed of 'impossibilities.' 'Impossible?' exclaimed Napoleon; 'there is nothing impossible; it is a word only found in the dictionary of fools.' The difference between genius and mediocrity lies chiefly in this matter of 'purpose;' for true genius has, what mediocrity usually wants, the capacity of labour. 'Work and Purpose' is the moral of every heroic life. It has been well and justly said, that 'whatever we wish, that we are; for such is the force of our will, joined to the Divine, that whatever we wish to be, seriously, and with a true intention, that we become.' Sir Fowell Buxton, himself a laborious worker, remarks: 'The distinction between the weak and the powerful, the great and the insignificant, is energy, invincible determination — a purpose once fixed, and then, death or victory! That quality will do anything that can

be done in this world, and no talents, no circumstances, no opportunities, will make a two-legged creature a man without it.'

6. Many men, from want of this inflexible resolution, though endowed with splendid talents, have passed away without accomplishing any good deed or noble action, without leaving behind them a 'shining mark' for the admiration of posterity; or any memorial by which the world might be the better for their having lived. Alcibiades was gifted with every grace of mind and person; was the idol of the gay Athenians; brave, eloquent, generous; yet he perished miserably, in a small Phrygian town, by the hands of blood-bedabbled Persian mercenaries. The Duke of Wharton, Pope's Duke of Wharton, was endowed with the highest intellectual gifts, and with every advantage of rank, affluence, and station, but he died in poverty—in a Spanish village—without a friend to soothe his latest murmurs. It seemed as if the fairies had loaded him at birth with a thousand blessings, but added that fatal curse of instability, which neutralises all. The bright and glittering Villiers, second Duke of Buckingham—

> A man so various, that he seemed to be Not one, but all mankind's epitome;

the favourite of his sovereign, the darling of the crowd—wit, poet, statesman, critic—died in shame, suffering, and indigence. For he,

In the course of one revolving moon, Was fiddler, statesman, poet, and buffoon,

and upon him, therefore, fell the old scriptural curse, 'Unstable as water, thou shalt not excel!' From this life which had budded and flowered in the lustre of a court, but to terminate miserably in a 'dull inn's worst room,' canst thou not, O youth, derive a lesson and a warning? So, too, with the poet Coleridge: 'What a mighty intellect,' said Robert Nicoll, 'was lost in that man for want of a little energy, a little determination!' It is not always the hare that wins the race: patient industry, plodding

diligence, resolute work, unchanging purpose — these are the qualities which achieve greatness.

7. Especially in the lives of men who have perfected noble inventions, or completed mechanical processes which have multiplied results while economising labour, are illustrated by the advantages of a steady aim-of work with a purpose. Days of toil and nights of thought have been ungrudgingly sacrificed, that the one fixed object might be secured. No obstacles have been suffered to daunt the earnest soul; no misgivings to paralyse the stalwart arm. In the extremest penury, in the bitterest desolation, these heroes have kept before them their settled resolve, and never doubted but that in the fulness of time the light and glory of success would break through the scattered clouds. 'Trifles light as air' have no power to move the enthusiastic Men in earnest are influenced as little by the ridicule of the ignorant as by the warnings of the learned. They have had faith in themselves and their mission, and gathered up all their powers to carry out the work they had set themselves to do. And the crown of victory has rewarded their efforts, even if the world has grudged them a tardy and a scanty recognition. These men, indeed, cared nothing for the world. Their reward was not the applause of multitudes, nor the stars and ribbons with which the unthinking are deluded. They laboured under a higher inspiration and for a more precious prize—the consciousness of having done well, the sweet delight of labour, the exquisite felicity of having succeeded. No true man will fret himself with the foolish query, What will the world say? Knowledge, like virtue, is its own reward; and to the earnest soul there is no greater gratification than to have deserved well of its fellows, to have aided, however so little, the onward march of humanity. 'Some men think,' says Lord Bacon, in stately phrase, 'that the gratification of curiosity is the end of knowledge; some, the love of fame; some, the pleasure of dispute; some, the necessity of supporting themselves by their knowledge: but the real use of all knowledge is this, that we should dedicate that reason which was given us by God to the use and advantage of man.'

EXAMPLES.

JAMES WATT.

1. James Watt was born at Greenock, on January 19, 1736. The son of a merchant, who was also one of the magistrates of that 'canny burgh,' in his youth he had not to encounter those difficulties which have beset so many of the world's greatest men—the privations and necessities arising from extreme poverty; but his health was so frail that he could not attend school, and his studies were pursued at home, without much more assistance than that afforded by his books.

At an early age he evinced a marked partiality for mechanical studies, which led to his being eventually apprenticed to a London mathematical instrument maker. His infirm health, however, prevented him from continuing under his instructions for any lengthened period. He then paid a visit to some relatives at Glasgow, and was induced to establish himself there as instrument maker to the University. He made up for the paucity of instruction he had received in his difficult trade by assiduous study, and soon became distinguished for the superior accuracy of his instruments. He also laboured at the acquirement of other branches of knowledge, despite his continuous ill health, and speedily attained a remarkable acquaintance with many of the most delicate mysteries of science. Such was his progress, though comparatively unassisted, in these arduous pursuits, that, in 1763, he felt competent to undertake the business of a general engineer, and abandoned his shop for the higher vocation. He rapidly obtained employment; and so wide was the reputation he had already won, that scarcely an improvement was now effected in the canals, roads, harbours, and bridges of Scotland without his advice, or except under his direction.

2. Meanwhile, his active and persevering intellect was intent upon one important pursuit, which was destined to revolutionise the world of Labour, and earn for himself an

imperishable fame: we mean the employment of Steam as a motive force, as a mechanical agency—an idea which had been suggested to his fertile mind by his friend Robison's experiments on the practicability of adapting it to the propulsion of wheel-carriages. He had not pushed his inquiries very far, however, when, in the winter of 1763, a small model of Newcomen's steam-engine was placed in his hands for repair. This was the spark which fired the train. This was the opportunity which comes to everyone of us, sooner or later, but which few men have the courage to seize and the ardour to improve as Watt did. His attention was now completely arrested, and from that fortunate hour to the end of his long and useful career, Watt's active mind and keen sagacity were devoted to the development of the motive powers of steam.

3. And here we must pause to sketch, very briefly, the progress of the steam engine from its first feeble outlines up to the time that Watt's intuitive sagacity recognised its

possible usefulness.

Solomon de Caus, a French engineer, published, in 1623, a volume of curious interest, in which is shadowed out the earliest rude conception of the expansive powers of vapour. He proposed the insertion of a perpendicular tube in a vessel of boiling water, nearly to the bottom, that through this tube might arcend the steam which the heat would throw off. A constant supply of water was obtained

through a tap in the side of the vessel.

4. Forty years later, the ingenious and loyal Marquis of Worcester published his famous 'Century of Inventions,' and among its various scientific problems appears (No. 68) 'An Admirable and Most Forcible Way to Drive up Water by Fire.' The peer's mechanism was founded upon the same principles as De Caus had enunciated. But De Caus had only theorised. The Marquis carried theory into practice, and advanced from speculation to experiment. He actually constructed an apparatus which, he says, forced water up to a height of 40 feet. To him, therefore, the honour must be ascribed of having creeted, rude and imperfect as was the model, the First Steam Engine.

- 5. Sir Samuel Morland, who was not only an able diplomatist but a skilful mechanician, added, about 1683, another fragment of experimental knowledge to the scanty store which the primitive fathers of the steam engine had slowly amassed. He pointed out the vast disproportion existing between the areas respectively occupied by a certain amount of water, and the steam which that amount produced. He estimated it as 1 to 2,000—no very important miscalculation, even when compared with the more definite result obtained by later enquirers (1 to 1,750).
- 6. Denys Papin, a native of Blois, who came to reside in England about 1678, and occupied himself for some years in mathematical studies and pneumatic experiments, made yet another step in advance, by the introduction of 'a piston' into the tube which carried off the steam from the boiler, or cylinder. This, indeed, was a feature of Otto Guericke's air-pump, and consisted in so fitting a rod or block to a longitudinal cavity that it moved up and down with freedom, while preventing the intrusion of any extraneous substance. Introducing water into the bottom of his cylinder, and heating it by a fire underneath, Papin had the pleasure of seeing his piston impelled by the expansive force of the generated steam. He then removed his furnace -an awkward necessity - and, the steam again condensing into water, a considerable vacuum was produced, through which the piston immediately descended.
- 7. Captain Savery's is the next name associated with the progress of the steam engine. His invention was suggested by an accident—an accident which had probably occurred a thousand times before, but never before happened to arrest the attention of a quick and ingenious observer. At a tavern, one day, he called for a flask of Florence wine, and, having drunk its contents, flung the empty vessel upon the fire. Soon afterwards he perceived that the heat had expanded into vapour, the drops of wine still adhering to its sides; and snatching it from the fire, while thus filled, he plunged it, mouth downwards, into a basin of cold water. A vacuum was instantly produced by the condensation of the steam, and the cold water rose within the

- flask. Savery seized upon this fact, deduced from it an inference, and applied that inference to a practical purpose. Creating a vacuum within a cylinder, he raised water to its level, and then directed it into another vessel, employing the expansive power of steam to force it to a considerable height. Thus he was enabled to construct an apparatus or forcing pump, still occasionally used, for the supply of stately mansions, or garden fountains, or artificial lakes, with water.
- 8. Dr. Desaguliers, in the year 1718, improved upon Savery's machine, by the application of the safety-valve—an idea which, in a somewhat different form, had suggested itself to Papin. The utility of the safety-valve is this: it is so weighted that up to a certain point it successfully resists the expanding force of steam, but when that point is passed, it spontaneously gives way, and suffers the giant element to escape before it can shatter into fragments the cylinder that would vainly seek to imprison it. For unless you vigilantly guard your Frankenstein, the monster will rend into pieces the magician who called him into being!

Desaguliers also invented a new method of condensation by injecting a stream of cold water within the boiler, instead of applying it externally in the cumbrous and extravagant way which Savery had adopted.

9. But the steam-engine owes more to Newcomen than to either of its previous patrons. This clever mechanician was a native of Dartmouth, and in himself affords an interesting example of the success which crowns the zealous devotion of one's powers to the fulfilment of a cherished ambition. He early addicted himself to scientific studies. In his later investigations into the capabilities of steam he was assisted by another ingenious Dartmouth mechanic, one John Calley, a glazier; and the two constructed an engine upon Papin's principle—the piston rising through the expansion of the steam, and descending through the pressure of the external air; —but they improved upon Papin and Savery, by introducing a jet of water into the cylinder, as Desaguliers had done. Their discovery, however, was made independently of him, and in ignorance that it had

occurred to any previous inventor. It is said to have been suggested to them by the accident of some water trickling into the cylinder through a hole which attrition had wrought in the piston. Wonderful faculty of Genius!—to seize upon the trifles unconsidered by ordinary minds, and educe from them the sublimest results! Is it not the true type of the mythic Midas, which changes all it touches into gold?

Newcomen's engine was really an atmospheric one, for steam was only employed to produce the vacuum in the cylinder, and the pressure upon the piston was furnished by the atmosphere: —a pressure which, with the most perfect mechanical contrivances, does not exceed 15 lbs. to every square inch. Nevertheless, its utility, in those days of imperfect scientific knowledge, was unquestionably considerable, and its inventor deserved the reputation he obtained. It soon underwent improvement at the hands of Potter and Beighton. Potter was a lad employed upon one of these engines to open and close the valves which alternately admitted water and steam, but, being of a playful disposition, contrived, by fastening the valve-handles with string to certain cranks and levers, to make the engine do its own Beighton, an able engineer, afterwards perfected this ingenious contrivance, and Newcomen's engine was then (A.D. 1718) as complete as it could well be made.

Having summarised thus rapidly the early annals of the steam-engine, we return to our review of James Watt's laborious career:—

10. So numerous were the defects in the models of Newcomen's engine which had been intrusted to him for repair, that Watt's powers of investigation were completely aroused. He carefully examined its mode of working, and soon discovered how imperfectly it fulfilled its intended object. He saw, first, that the cylinder was not of a capacity to supply steam for the creation of a proper vacuum; and, second, that such power as the engine did possess was not judiciously economised. Carrying his researches farther, he began to inquire whether greater results ought not to flow from the employment of so potent

a slave, and instituted a series of ingenious experiments upon the characteristics and properties of this new motive force. Thus, he constructed a boiler which showed, on inspection, the amount of water evaporated in a given time, and he ascertained that the rapidity of its evaporation was regulated by the extent of surface-heat applied to the water, . . . that steam would heat six times its weight of spring-water up to its own temperature, or 212° Fahrenheit.

11. Having prepared himself for his self-imposed task by the most comprehensive investigations, unconsciously observing the maxims of that inductive philosophy which Bacon established upon the ruins of the Stagyrite's visionary theories, Watt now proceeded to consider how the defects of Newcomen's engine might be amended. One radical fault was its imperfect employment of the motive power of the steam. Every time cold water was injected, not only was the steam condensed, but the cylinder cooled—a manifest waste of heat and power. Watt's intellect was busy for many an anxious hour in designing remedies for this cardinal deficiency. At last there occurred to him, while taking one afternoon his customary exercise, an expedient of exquisite simplicity, which nevertheless removed every difficulty; namely, to draw off the steam from the cylinder and condense it in another vessel. one or two days, he says, the entire details of the necessary mechanical agencies were arranged in his mind, and he had conceived the main features of the present condensing steam engine . . . an invention whose beneficial influence upon the history of our race can hardly be over-estimated. Connect the cylinder by an open pipe with another vessel, and the elastic vapour will immediately flow from the former, as soon as admitted into the latter, where, subjected to the action of cold water, it will at once condense. vacuum thus created, more steam will be instantly supplied by the cylinder; and this movement will continue, until the cylinder has been completely emptied without exposure to a single drop of water, the condenser alone being cooled by the cold water used to concentrate the steam. Watt found his invention attended with entire success: the cylinder, though emptied of its steam before every stroke of the piston, maintained an equable temperature at the same height as steam itself—viz. 212°, and consequently the engine was now heated, and kept in operation, with one-fourth of the fuel formerly employed.

12. Watt's next great difficulty was the utilisation of the expansive force of the steam; this he effected by dispensing with atmospheric power above the piston, and making use in its stead of alternations of steam and a vacuum in the same manner as they were employed below it. He opened communications from the upper part of the cylinder to the boiler on the one hand, and the condenser on the other, enclosing the whole in an air-tight chamber, in whose cover or roof an aperture was left to admit the rod or shank of the piston, which was, moreover, fully padded round with hemp, the more completely to exclude the air. By various ingenious contrivances it was arranged that while the cylinder showed a vacuum at one end, steam was poured in at the other; the steam so admitted creating the necessary vacuum by its speedy condensation, and impelling the piston by its expansive force.

13. Our space will not permit us to dwell upon the numerous minute but valuable improvements which Watt's inexhaustible ingenuity devised during ten long years of unrewarded toil. Unrewarded, do we say? It is true that, at first, the world little heeded the invention or the inventor, but not the less did he find an exceeding recompense for

his labours in the sweet consciousness of success.

But while thus engaged in perfecting the wonderful machine which was destined to effect such marvellous changes in our habits and customs—to revolutionise the relations of classes—to multiply the sources of national wealth—Watt was constrained to a hand-to-hand fight with Poverty, and perplexed by the embarrassments of an increasing family and a precarious avocation. To eke out his scanty income, he added land-surveying to his numerous other pursuits, and gladly executed any species of honest work which fell in his way. For the man had a grand

seventy, to prove the enduring vitality of his intellectual powers, he devoted himself to the study of the Anglo-Saxon language, and mastered its intricacies with surprising facility. Meanwhile, the sale of his steam engines produced so large a yearly income that, in 1801, he was happily enabled to retire from any active participation in the business of the firm. His name was honoured throughout the civilised world. France had her Napoleon; but England her James Watt. And more renowned by far the 'victories of peace' which crowned with laurels the brows of the Saxon mechanician, than the blood-red triumphs which had clothed the Corsican hero in Consular purple!

17. In 1785, Watt was elected a Fellow of the Royal Society. The University of Glasgow, in 1806, conferred the degree of Doctor of Laws upon its former mathematical instrument maker. In 1808, he was unanimously elected a member of the French Institute. Thus, rich in honours, in the admiration of his contemporaries, in the assurance of an undying fame, James Watt spent the closing years of a calm and earnest life, passing away, in tranquil hope of a blessed resurrection, on August 25, 1819, in the 84th year

of his age.

Watt was a man of no ordinary calibre. He was not possessed by one idea to the exclusion of all others, but had acquired an intimate knowledge of most of the important branches of human learning. It was said of him that 'it seemed as if every subject casually started in conversation had been that which he had been last occupied in studying and exhausting.' He understood almost every science, theoretically as well as practically. nothing upon which he was not an authority, from the construction of a steam engine to the cure of a smoking chimney. He was an assiduous reader, and had the art of making the best use of what he read—of deriving from even the most worthless book some novel information—of discovering grains of gold where others would have detected only rubbish. 'Perhaps no individual in his age,' says Lord Jeffrey—certainly no incompetent judge—'possessed so much and such varied and exact information—had read

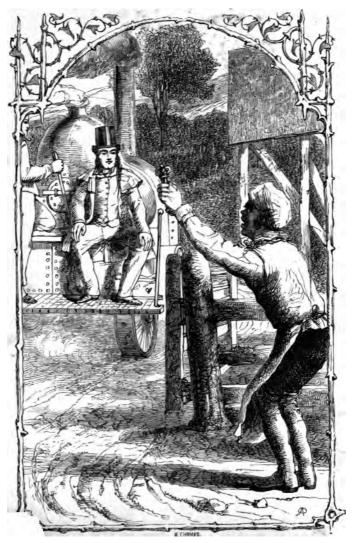
so much, or remembered what he had read so accurately and well. He had infinite quickness of apprehension, a prodigious memory, and a certain rectifying and methodizing power of understanding, which extracted something precious out of all that was presented to it. His stores of miscellaneous knowledge were immense, and yet less astonishing than the command he had at all times over them. That he should have been minutely and extensively skilled in chemistry and the arts, and in most of the branches of physical science, might perhaps have been conjectured; but it could not have been inferred from his usual occupations, and probably is not generally known, that he was curiously learned in many branches of antiquity, metaphysics, medicine, and etymology, and perfectly at home in all the details of architecture, music, and law. He was well acquainted, too, with most of the modern languages, and familiar with their most recent literature. Nor was it at all extraordinary to hear the great mechanician and engineer detailing and expounding, for hours together, the metaphysical theories of the German logicians, or criticizing the measures or the matter of the German poetry.'

Watt's personal appearance was that of a grave and reserved student. His head was generally bent forward; he stooped at the shoulders; his chest fell in; his limbs were lank but muscular; his complexion 'sicklied o'er with the pale cast of thought.' His manners were exceedingly modest and prepossessing; his voice, deep and low; his articulation, measured and distinct. He was a zealous admirer of the graces of fiction, and himself possessed no ordinary powers as a romancist—his stories, told in his own effective and impassioned manner, being the charm and wonder of the circle that gathered round him. Such was James Watt, the inventor of the Steam Engine.

LOCOMOTIVES: THEIR PROGRESS.

1. The application of steam to the purposes of locomotion had been suggested by many ingenious speculators; by Savery, Robison, and Watt, in England; by Oliver Evans, in the United States; by Cugnot, in France. But the first definite attempt to realise the idea was undoubtedly that of William Murdock, Watt's assistant, in 1784. His model was constructed on the high-pressure principle, and ran upon three wheels. The boiler was heated by a spirit lamp, and the dimensions of the whole may be inferred from the fact that it was not above thirteen or fourteen inches high. Yet it attained, or even excelled, the speed of an ordinary runner. One night, when the inventor was returning from his labours in the mine at Redruth, in Cornwall, he resolved to test the powers of his machine, and selected for the purpose a pathway leading to the church, about a mile distant from the town. It was narrow, and bordered by high hedges on either hand. Lighting the lamp, Murdock soon had the satisfaction of getting the boiler heated, but the moment a sufficient quantity of steam was generated, away sped the tiny locomotive, and away, at full speed, started the inventor after it! Soon his ears were assailed by cries of alarm, and when he overtook his runaway machine, he found they proceeded from the rector of the parish, who, meeting the hissing and flaming pigmy on his road, concluded it could be nothing else but a device of the Evil One! Though so far successful, Murdock, for unexplained reasons, made no further effort to develope his invention.

2. The idea, however, fell upon fruitful soil. A friend and pupil of Murdock's was careless *Richard Trevithick*, one of the 'captains' in a Cornish tin-mine, who, influenced probably by Murdock's experiments, resolved upon constructing a steam carriage for use upon ordinary roads. Obtaining pecuniary help from his cousin, Andrew Vivian, he took out a patent in the year 1802, and a locomotive



THE TOLLMAN'S TERROR:

An Anecdote of Trevithick and Vivian.

soon issued—a Minerva in full armour—from Trevithick's fertile brain. In appearance it resembled the ordinary four-wheeled stage-coach—the engine, which consisted of one cylinder, with a boiler and furnace-box, being placed in the rear of the hind axle. The movement of the piston was transmitted to a separate crank-axle, and the latter, by means of certain mechanical contrivances, also set in operation the axle of the driving-wheel, which, by the way, was mounted with a fly-wheel. The same crank-axle worked the steam-cocks and the force-pump, as well as the bellows which quickened the combustion of the fire.

3. This successful machine having exhausted the curiosity of half Cornwall, Trevithick and Vivian decided upon exhibiting it in London, that it might receive the stamp of metropolitan approval; they accordingly 'steamed' as far as Plymouth, whence it was to be forwarded to London by sea. An amusing incident occurred on the road:—While rolling along in full force, to the terror of every gaping yokel they met with, Vivian caught sight of a tollgate ahead, and called out to Trevithick, who drove the engine, to slacken speed. Trevithick obeyed the injunction, but the machine had acquired so great an impetus from the rapid rate at which it had been proceeding, that it was with difficulty stopped just as the bar was reached. The tollman flung wide his gate with trembling obsequious-'What have us got to pay here?' cried Vivian. 'Na, na, na,' stuttered the terrified tollman. 'What have us got to pay, I ask you?' again shouted Vivian. 'Nonoth-nothing to pay! My de-dear Mr. Devil, do drive on as fast as you can! There's no-nothing to pay!'

4. Some experiments on the Wandsworth and Croydon tramway, where horses were employed to drag to and fro the coal-wains, suggested to Trevithick's active imagination the possibility of adapting his steam engine to the iron road, and thus was shadowed forth the future railway locomotive, which was to accomplish so much for the diffusion of intelligence and the annihilation of local prejudices. His tramway engine was completed in 1804, and its merits first tested upon the Merthyr Tydvil Railway, in

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South Wales. The trial was, to a certain extent, a success. The engine dragged after it, at the rate of five miles an hour, several wagons loaded with ten tons of bar iron; but it was found unfitted for regular working. In like manner had Watt's first steam engine failed. But Trevithick lacked Watt's stability of resolve and steadiness of purpose. Instead of concentrating all his powers upon the successful development of his invention, he abandoned it for 'fresh fields and pastures new,' and lost the opportunity of securing a renown only second to that of Watt's. The Cornish miner was a man of remarkable ability, but he wanted in perseverance. He flew from scheme to scheme with childish cagerness, and consequently met with failure upon failure. Then he lost heart, and vented his disappointment in jeremiads against fortune. 'The world always went wrong with him,' he said. Alas! this is the continual complaint of the man who is always going wrong with himself, and frets through a profitless life without — a Steady Aim!

5. An imaginary difficulty at first beset the minds of the ingenious men who laboured upon the locomotive. They fancied that the smooth wheels of the engine (if any considerable burden rolled behind) would not bite or grip the equally smooth rails of the tramroad, but would fly round and round without making any real progress. To obviate this supposed result, Mr. Blenkinsop, of Leeds, in 1811, obtained a patent for a racked or tooth-rail to be laid along one side of the tramroad, into which the enginewheels worked as pinions fit into a rack. This cumbrous contrivance restricted the speed of the engine to about 31

miles per hour.

6. William Hedley, a 'viewer' in Mr. Blackett's colliery, near Wylam, constructed, about 1813, a locomotive engine upon improved principles, and 'Puffing Billy,' as it was called, continued in use for several years. It is now preserved in the Patent Museum at South Kensington, and is well worth the examination of the scientific enquirer. But, without seeking to detract from the merits of Hedley or his predecessors, it must fairly be owned that the real father of the locomotive, as Watt was of the steam engine — not, indeed, the first inventor, but the man who rendered practicable the rude conceptions of that inventor — was George Stephenson, the Railway Engineer; to whose remarkable career we would now direct our young readers' attention, as a signal illustration of the success in life which results from the concentration of one's powers upon a Steady Aim.

GEORGE STEPHENSON.

1. George Stephenson, the son of Robert Stephenson, an engineman at the Wylam Pit, was born in a small labourer's cottage in the village of Wylam, on June 9, 1781. As his father's earnings did but amount to twelve shillings weekly, the early years of the future engineer were necessarily passed amid all the discomforts of extreme poverty. No advantages of school instruction were within his reach, and George's time was spent in birds'-nesting, running errands, playing with the village children, assisting in nursing his younger brothers and sisters, and watching the coal-wagons drawn by horses along the wooden tramway of Wylam.

When he was eight years old, his father obtained employment at the Dewley Burn Colliery as an enginefireman, and young Stephenson made his début in life as cow-keeper for the widow Ainslie, the occupant of a neigh-He received as reward for his bouring farm-house. labours - which were light enough - two pence a day. Having many idle hours to dispose of, he spent them in the company of his boon companion, Bill Thirlwall, and his amusements even at this early age were curiously indicative of his scientific tastes. In the water-courses of that marshy country-side he erected numerous little mills. He fashioned engines out of clay, employing hemlocks to represent their tubes and pipes. And further, he constructed a winding machine, which his imitation engines were supposed to work, and pretended to lower 'the corves' into an imaginary coalpit, and draw them up again.

2. Advancing in years, he advanced in responsibilities, and was promoted from cow-tending to farm labour—to

hoe the turnips, lead the plough-horses, and make himself generally useful, at 4d. per day. But his ambition was only content when, at last, he was employed in the colliery where his father worked. Here, his first vocation was that of a 'corf-bitter' or 'picker,' and for 6d. a day he cleared the coals of all stones and refuse. But, at the wage of 8d. daily, he was promoted to drive the gin-horse. His pastimes at this period were principally associated with birds and animals, and his blackbirds and his rabbits were the wonder of the countryside. He was full, we are told, of fun and tricks; and 'there was nothing under the sun but he tried to imitate.'

3. At fourteen years of age, he made a great stride forward in his career, being appointed, at the daily wage of 1s., assistant fireman at Dewley—a post not usually given to one so young. The Dewley Pit being soon afterwards worked out, the Stephensons removed to Jolly's Close, near Newburn, where the Duke of Northumberland had recently opened a fresh mine. In due time the assistant fireman became, at a neighbouring pit, fireman on his own account. He received no increase of pay, but had a better opportunity of studying the mechanism and properties of an engine, and so fitting himself to eventually occupy the position which, as yet, was the most daring conception of his imagination—that of engineman, at a man's full wage.

This pit, in its turn, having been exhausted, George Stephenson, who had already acquired a character for industry, steadiness, and honesty, was next employed upon an engine near Throckley Bridge, and his weekly pay was raised to the enormous sum of 12s.! An inexhaustible Puctolus seemed to be now at the young engineman's disposal. 'I am a made man for life!' he joyously exclaimed, as he left the foreman's office after receiving the intelligence of

his good fortune.

4. Some months passed, and a new pit being opened at Water Row, half a mile west of Newburn, a pumping engine was crected there; and old Stephenson was appointed to it as fireman, and his son as the engine- or plug-man. Thus, at the age of seventeen, the son had contrived to shoot ahead of his father, occupying a more responsible post, and receiving higher wages. He now devoted himself sedulously to the study of his engine, and soon acquired so correct a knowledge of the uses of its different parts, so speedily obtained a thorough acquaintance with the principles of its construction, that when it fell out of order, he was usually enabled to repair it without the assistance of the colliery engineer.

5. Having attained thus far, Stephenson's enquiring mind became only the more anxious to advance yet farther. He saw, however, that he could accomplish nothing more without the aid of books, and books were sealed treasures to him, because he was unable to read. But though arrived at the very threshold of manhood, Stephenson was not ashamed to confess his ignorance, nor too proud to submit to the drudgery of rudimentary knowledge. instructor was one Robin Cowens, a poor teacher, who kept a night-school for the sons of colliers and other labourers in the neighbouring village of Walbottle. Of him the young engineman took lessons, three times a week, in reading and spelling, and such was his ardour, such his unconquerable perseverance, that he soon learnt to read, and before he was nineteen could even write his own name. Delightful knowledge! Precious acquirements! Little can those more favoured students, for whom Fortune, if she lays not down 'a royal road' to Learning, at least smooths away the difficulties and plants the wayside with flowers, appreciate the intense, the unutterable joy that fills the soul of him who, beset by many an obstacle and with no friendly hands to help, succeeds, nevertheless, in climbing the rugged steep of Knowledge!

6. In the winter of 1799, Stephenson added arithmetic to his other studies, receiving instruction from Andrew Robertson, a Scotchman, who established a night-school at Newburn. The progress he made was surprising; but the young engineman knew the value of time, and improved every spare moment he could steal from his engine in working out the problems proposed by his tutor.

The wonderful perseverance of this steadfast-hearted

man was signally illustrated by the means he adopted to secure another advance in his laborious vocation. Brakeing an engine is 'one of the higher departments of colliery labour,' and among the most remunerative; Stephenson was therefore anxious to master its secrets. 'A small winding engine having been put up for the purpose of drawing the coals from the pit, Bill Coe, his friend and fellow-workman, was appointed the brakesman. He frequently allowed George to try his hand at the brake, and instructed him how to proceed. But in this course Coe was opposed by several of the other workmen—one of whom, a brakesman named William Locke, went so far as to stop the working of the pit, because Stephenson had been called in to the brake. But one day, as Mr. Charles Nixon, the manager of the pit, was observed approaching, Coe adopted an expedient which had the effect of putting a stop to the opposition. He forthwith called upon George Stephenson to "come into the brake-house, and take hold of the machine." No sooner had he done this, than Locke, as usual, sat down, and the working of the pit was stopped. Locke, when requested by the manager to give an explanation, said that "young Stephenson couldn't brake, and, what was more, never would learn to brake: he was so clumsy that he was like to rive his arms off." Mr. Nixon, however, ordered Locke to go on with the work, which he did; and Stephenson, after some further practice, acquired the art of brakeing.'

7. In 1801, Stephenson removed to the Dolly Pit, at Black Callerton, where, notwithstanding his comparative youthfulness, he was appointed to the important post of brakesman. He also increased his income by shoe-mending, and as he grew a proficient in Crispin's art, shoe-making, partly employing his scanty leisure in study, and partly in recommending himself to the favour of Fanny Henderson, a handsome and virtuous young woman, the servant of the small farmer in whose house he lodged. Out of his shoemaking and shoe-mending earnings George soon saved his first guinea, and felt himself the master of a seemingly inexhaustible mine of wealth. The 'first guinea,' indeed,

is no trivial matter to a hardworking mechanic; it is the promise of many more, and the visible testimony—the indisputable witness—to hours of toil and a life of selfdenial.

8. Both in arithmetic and in writing, our hero-brakesman had now accomplished a considerable progress, and by the time of his marriage, November 28, 1802, he knew more of the mysteries of figures than his Scotch dominie, and wrote a hand of the most legible character. Immediately upon this memorable event, he took and furnished (his guinea having duly multiplied) a small house at Willington Quay, whither he now went to work as brakesman of a fixed engine on the Willington Ballast Hill, about six miles below Newcastle. Here his daily life continued to be that of a self-contained, industrious, and energetic workman; a workman who rejoiced in and was proud of his labour, but, nevertheless, hoped some day to rise to a loftier and more intellectual position. His leisure hours were accordingly devoted to modelling experimental machines, and studying the principles of mechanics. He made an effort to solve the difficult problem of perpetual motion, and indulged in other speculations, quite as visionary, but all indicative of an active and enquiring mind.

A considerable addition was now made to his yearly gains. One day, while away from home, his cottage chimney took fire, and his neighbours, in their zeal to extinguish the flames, deluged his furniture with water, and specially injured his eight-day clock. Stephenson characteristically determined upon endeavouring to mend his horologe himself. He took it to pieces; he probed it here, and tried it there; and, finally, after no slight pains, had the satisfaction of seeing it in thorough order. His success was soon bruited abroad, and every uncanny clock in the neighbourhood was henceforth put into his hands to be

repaired.

9. After a residence of three years at Willington Quay where, on October 16, 1803, was born his only son Robert— Stephenson removed as brakesman to the extensive West Moor Colliery, at Killingworth. He had scarcely settled down in his new home, when he was afflicted with a blow which fell heavily upon his manly and loving nature, the death of his young and amiable wife. Happily, he was diverted from brooding over his loss by a sudden change of scene and occupation. He accepted an engagement to superintend the operations of one of Boulton and Watt's steam engines, at some large spinning-works, near Montrose (in Scotland). He was absent from Killingworth about a twelvemonth, and in that time increased his savings by the sum of eight-and-twenty pounds.

10. On his return he found his father in extreme distress. He had lost his eyesight through an accident, and was unfit for further work. George Stephenson paid the old man's debts, amounting to some 15l., and removed him and his mother to a comfortable cottage at Killingworth, where he was again employed as brakesman. England was now in the heart of her struggle with Imperial France. A levy was summoned of 200,000 militia, and it fell to Stephenson's lot to be drawn as a militia man. He must either go as a soldier, or find a substitute. He chose the latter expedient, paying a sum of money, as bounty, which stripped him of

his Montrose savings.

11. A life of struggle and self-denial, of unquailing resolution and unremitting industry; a life of close application and constant study; — so passed the years with Stephenson, until, in 1810, an incident occurred which proved the foundation of his future fame. A pit had been sunk at Killingworth, which is now known as the Killingworth High Pit, and a Newcomen (or atmospheric) engine, originally made by Smeaton, was employed to pump the water from the shaft. Owing to some undiscoverable cause, it failed to answer the purpose. It pumped, and pumped, but did not open the pit. Thus it continued to expend its fruitless labour for nearly a twelvemonth, puzzling all the experienced engineers of the neighbourhood. Stephenson examined it twice or thrice. At last, one Kit Heppel said to him, 'Weel, George, what do you mak' o' her? Do you think you could do anything to improve her?' 'Man,' replied Stephenson, 'I could alter her and make her draw;

in a week's time from this I could send you to the bottom.' The brakesman's assertion was made known to Ralph Dodds, the head viewer, who had already formed a high opinion of his acuteness. He resolved to give Stephenson a trial. 'You must set to work immediately,' he said to him; 'we are clean drowned out, and cannot get a step further. The engineers hereabouts are all bet; and if you really succeed in accomplishing what they cannot do, you may depend upon it I will make you a man for life.'

12. Choosing his own workmen, a privilege he wisely insisted upon, Stephenson took the engine to pieces, and thoroughly repaired and altered it. In four days' time the task was done. On the Thursday the engine was kept continually at work, and on Friday afternoon the pit was so far cleared that the miners were able to descend its shaft. Dodds, in his delight, gave Stephenson ten pounds, and appointed him engineman at the High Pit, upon a good salary. His repute as a pump-curer was, moreover, noised abroad, and he soon derived a decent income from the repairs he effected in the engines of the neighbouring collieries.

13. Dodds did not forget the man who had helped him in his need, and in 1812, Stephenson was promoted to the post of engine-wright of the colliery, at a yearly salary of 100l. With a wider range of duties the powers of his mind were correspondingly developed, and he accomplished a variety of important improvements in the working of the colliery, which attracted the attention and received the approval of its lessees—the Earl of Strathmore, Sir Thomas Liddell, and Mr. Stuart Wortley. He erected, with complete success, a winding engine and a pumping engine, and laid down a self-acting incline, so arranged that the full wagons in their descent drew up the empty ones. Meanwhile, he laboured assiduously to store his mind with knowledge—which he recognised as the right hand of genius—and, mindful of his own early disadvantages, was careful that his son Robert should be provided with a liberal education. The twain, indeed, were fellow-pupils; the father progressing as the son advanced; and the son

deriving no inconsiderable benefit from his father's quick

perception and shrewd discrimination.

14. For some time the elder Stephenson's attention had been directed to the new experiment of steam-locomotion, and his clear intellect had comprehended the vast results that must flow from its success. Trevithick's locomotive and Hedley's 'Puffing Billy' were both in work at Wylam, his birthplace, and thither Stephenson proceeded to examine them. Having mastered every detail, he exclaimed, with the confidence of genius, that he could make a better engine than either, and to carry out his boast now became the object of his earnest and laborious life.

He was encouraged in his design by Lord Ravensworth (Sir Thomas Liddell), who, after hearing his enginewright's animated exposition, agreed to supply the necessary funds. Not the less had many an obstacle to be surmounted before Stephenson could exclaim 'Eureka!' The chief difficulty was the ignorance of his workmen, but his perseverance overcame every impediment; his ingenuity was ready with a device to remedy every unexpected failure; and, at last, on July 25, 1814, his first locomotive was placed upon the

Killingworth Railway.

It succeeded in drawing thirty tons' weight at about four miles an hour, but after a lengthened trial, was found no cheaper than horse labour, and no swifter than horse speed. The locomotive might, therefore, have fallen into disuse as a comparative failure, if Stephenson's quick imagination had not, at this critical moment, suggested the application of the steam blast to quicken the consumption of fuel in the furnace, thus doubling at one stroke the power of the engine. Other improvements followed, and on February 28, 1815, Stephenson, in conjunction with Mr. Dodds, who supplied the necessary capital, took out a patent for a new, economical, and simple locomotive—the type, in every important feature, of the modern railway engine. Such success had crowned Stephenson's concentration of his powers upon one Steady Aim!

15. But of the resolute, nay, heroic perseverance, which was so marked a feature of Stephenson's character, a more

striking illustration, perhaps, is afforded in his invention of the 'Geordy' Safety Lamp. Its necessity was painfully impressed upon his mind by an explosion which occurred in the deepest main of the Killingworth Colliery in 1814. When intelligence of the disaster reached his cottage he immediately hastened to the pit-mouth, about a hundred yards distant, whither the women and children of the colliery were fast running, with wildness and terror depicted in every face. 'In an energetic voice,' says Mr. Smiles, in his admirable biography, 'Stephenson ordered the engineman to lower him down the shaft in the corve. There was danger. it might be death, before him, but he must go. As those about the pit-mouth saw him descend rapidly out of sight, and heard from the gloomy depths of the shaft the mingled cries of despair and agony rising from the work-people below, they gazed on the heroic man with breathless amazement.

'He was soon at the bottom, and in the midst of his workmen, who were paralysed at the danger which threatened the lives of all in the pit. Leaping from the corve on its touching the ground, he called out, "Stand back! Are there six men among you who have courage enough to follow me? If so, come, and we will put the fire out!" The Killingworth men always had the most perfect confidence in George Stephenson, and instantly they volunteered to follow him. Silence succeeded to the frantic tumult of the preceding minute, and the men set to work. In every mine, bricks, mortar, and tools enough are at hand, and by Stephenson's direction materials were forthwith carried to the required spot, where, in a very short time, the wall was raised at the entrance to the main, he himself taking the most active part in the work. The atmospheric air was by this means excluded, the fire was extinguished, the people were saved from death, and the mine was preserved.'

It had long been acknowledged that the miner's great desideratum was a lamp that, while giving him sufficient light to prosecute his underground labours, would not set fire to the inflammable gas, or 'fire damp,' which collects in the less ventilated parts of the pit. A colliery lamp had been

invented in 1818 by a Dr. Clauny, but rejected on account of its cumbrousness, and in 1815, a year after the Killingworth explosion, several gentlemen interested in mining called Sir Humphry Davy's attention to the subject, and his enquiries resulted in the invention of the Safety Lamp now generally in use. But the great chemist had already been forestalled by the Killingworth enginewright, who, however, had no means of making his discovery known to the general public or men of science.

16. Stephenson began by experimenting upon the properties and nature of the fire damp. The conclusions he

arrived at may be stated in his own words:-

'Seeing the gas lighted up, and observing the velocity with which the flame passed along the roof, my attention was drawn to the contriving of a lamp, seeing it required a given time to pass over a given distance. My idea of making a lamp was entirely on mechanical principles; and I think I shall be found quite correct in my views, from mechanical reasoning. I knew well that the heated air from the fire drove round a smoke-jack, and that caused me to know that I could have a power from it. I also knew very well that a steam-engine chimney was built for the purpose of causing a strong current of air through the fire. Having these facts before me, and knowing the properties of heated air, I amused myself with lighting one of the blowers in the neighbourhood where I had to erect machinery. had it on fire; the volume of flame was coming out the size of my two hands, but was not so large but that I could approach close to it. Holding my candle to the windward of the flame, I observed that it changed its colour. I then got two candles, and again placed them to the windward of the flame; it changed colour still more, and became duller. I got a number of candles, and, placing them all to the windward, the blower ceased to burn. This then gave me the idea, that if I could construct my lamp so as, with a chimney at the top, to cause a current, it would never fire at the top of the chimney; and by seeing the velocity with which the ignited fire-damp passed along the roof, I considered that if I could produce a current through

tubes in a lamp equal to the current that I saw passing along the roof, I should make a lamp that could be taken into an explosive mixture without exploding externally.'

The lamp was designed, and its construction intrusted to some well-known Newcastle manufacturers, who placed it, completed, in Stephenson's hands, on October 21. It now became necessary to test its merits. Mr. Wood, the head viewer, Moodie, the under viewer, and young Robert Stephenson, proceeded with the inventor to the Killingworth Colliery. It was near midnight when they reached the mine and descended the shaft. They moved towards the foulest gallery in the pit, where the explosive gas issued from a blower in the roof, with the fierce hiss of a jet of steam. Some boarding was erected to concentrate the foul air in one particular spot. Moodie advanced, examined that spot, and returned, declaring that, if a light were now introduced, an explosion must assuredly ensue. He added a warning as to the peril to themselves and the pit if, indeed, the gas took fire.

17. Stephenson was as confident in his lamp as he was resolute in his noble ambition to conquer the dangers of the fire-damp. He bade his companions stand back, and, lighting the wick, advanced with steady nerve towards the inflammable air. Less and less distinct fluttered the tiny ray of that Lamp of Safety as its courageous bearer penetrated the depths of the mine. He was moving forward,—perhaps to death,—but his heart never quailed, his hand never trembled. Heroism this, as it seems to us, not inferior to that of the martyr who braves the scaffold or the stake rather than palter with his belief in the truth! And far purer—far more glorious—than that of the soldier who, with heart a-fire and soul a-flame, throws himself, in the madness of the battle, upon the deadly steel of the foe.

Arrived at the place of danger, he stretched out his lamp in the full rush of the explosive gas, and awaited the issue. At first, the flame of the lamp increased; then it wavered and waned; finally, it expired. But the foul air made no further sign. There was no explosion! Stephenson returned rejoicing to his anxious companions, and informed them of the success of his experiment. They plucked up their courage, and accompanied him to see it repeated. Gaining confidence in their continued safety, Wood himself ventured to hold up the lamp to the blower. Thus it became undoubtedly evident that Stephenson had invented a method of lighting up a mine without the risk of

setting fire to its combustible air.

This first lamp, however, was defective in many particulars, and its inventor set himself to work to improve it. A second was made, but, not fulfilling all Stephenson's requirements, was flung aside, and a third constructed. The third proved a complete success, and many lamps made after its model are now in use in the Northern collieries. But its inventor has never received the credit justly due to him, owing to the superior celebrity of Sir Humphry Davy, whose well-deserved fame as a scientific chemist introduced his Lamp to the public with credentials the public could not fail to appreciate. In 1818, it is true, a scanty measure of justice was apportioned to the Killingworth enginewright, and he was presented with a testimonial of the value of 1,000l., because, as was stated, 'he had discovered the fact that inflamed fire-damp will not pass through tubes and apertures of small dimensions, and because he was the first to apply that principle in the construction of a safety-lamp calculated for the preservation of human life in situations formerly of the greatest danger.'

18. Stephenson now returned to his labours on the locomotive, daily considering how it might be rendered more economical as well as more efficient, and, while building a second and improved engine, he also directed his attention to the state of the road on which it would be propelled. But the ingenious contrivances he adopted, and the important modifications he effected, cannot be treated of in our limited space, and would lead us, moreover, too far away from our original design. It is sufficient to state that he triumphed over every impediment, and constructed engines which are still in operation at Killingworth, conveying heavy coal-trains at the speed of between five and six miles an hour, probably as economically as any of the more perfect locomotives now in use.'

- His invention as yet, however, was not known to the general public, and there seemed so little prospect of its obtaining a wider patronage in England than it had already received, that Stephenson entertained serious thoughts of emigrating to the United States, as offering a wider field for industrious enterprise. At this juncture the owners of the Hetton Colliery, in Durham, resolved on laying down a railway from their pits to the shipping-quay, near Sunderland, a distance of about eight miles, and invited Stephenson to survey the line and superintend the works. In this new sphere of operations his great mental powers found ampler room for their development. The line was admirably executed, and furnished with effective locomotives from his own design. Each engine travelled at about four miles an hour, and dragged after it a burden of sixty-four tons.
- 19. His next successes were won in connection with a work of far more ambitious proportions, the Stockton and Darlington Railway, of which the clear-seeing, energetic, and self-reliant Quaker, Edward Pease, was the projector and principal supporter. The obstacles thrown in his way by ignorance and prejudice would have crushed any less ardent and determined spirit, but Pease was a man of purpose, and men of purpose are not to be silenced by clamour or defeated by opposition. The line was surveyed in August 1821, and the first rail laid on May 23, in the following year. The permanent way was formed of wrought instead of cast iron; the gauge was limited to the width of ordinary vehicles, 4 feet 8 inches, and new improvements were introduced into the locomotives designed to work upon it. Success attended Stephenson in every effort, and the railway was formally opened, in the presence of assembled thousands, on September 27, 1825. The inaugural train consisted of six wagons loaded with coals and flour, of a passenger carriage for the directors, of twenty-one wagons temporarily fitted up with seats, and six wagons piled with coals. 'The signal being given,' says a contemporary chronicle, quoted by

Mr. Smiles, 'the engine started off with this immense train of carriages; and such was its velocity, that in some parts the speed was frequently twelve miles an hour, and at that time the number of passengers was counted to be 450, which, together with the coals, merchandise, and carriages, would amount to near ninety tons. The engine with its load arrived at Darlington, a distance of 83 miles, in sixty-five minutes. The six wagons loaded with coals intended for Darlington, were then left behind; and obtaining a fresh supply of water, and arranging the procession to accommodate a band of music, and numerous passengers from Darlington, the engine set off again, and arrived at Stockton in three hours and seven minutes, including stoppages, the distance being nearly twelve miles.' The 'LOCOMOTIVE No. 1,' the first engine that travelled upon the first public railway, now occupies a post of honour in front of the railway station at Darlington.

20. A man's good fortune is like a snowball, which increases in dimension with every inch it travels. When once the light of success shines upon the path of industry, the wayside blooms with flowers, and the air grows musical with Success looks at the future through the rose-coloured vial of Marmontel's charming story. Stephenson's perseverance had crossed the boundary line between the world of theories and the world of facts. He had won a name, a reputation. His genius had compelled recognition. tongues of men were busy in his praise. Henceforth, then, his life was a long series of felicitous achievements, and he found the world only too eager to do honour to the successful man.

21. The impetus given to the cotton manufacture by Arkwright's inventions had transformed Liverpool and Manchester into vast and busy emporiums, and every year the necessity of improved intercommunication grew more apparent. At length some enterprising merchants took up the subject, and a scheme was originated for laying down a tramroad between the two great cotton marts. After years of debate, and doubt, and hesitation, the success of the Killingworth locomotives induced the projectors to abandon

a tramway, and determine upon a railroad and the employment of steam carriages. The plans and estimates required by Parliament were accordingly got ready. In making the necessary survey, Stephenson, to whom the promoters intrusted the task, was met with every obstacle which the canal owners, and first and foremost the Duke of Bridgewater's agent, could throw in his way. But they mistook the character of the man; he was neither to be daunted by threats nor cajoled by promises. The survey was successfully completed, and arrangements were made for proceeding with a Bill in Parliament in the Session of 1825. Now, indeed, the canal companies, who had hitherto enjoyed a complete monopoly of the traffic between the two towns, were up in arms! They prepared to resist the measure tooth and nail. 'The public were appealed to on the subject; pamphlets were written and newspapers hired to revile the railway. It was declared that its formation would prevent cows grazing and hens laying. The poisoned air from the locomotives would kill birds as they flew over them, and render the preservation of pheasants and foxes no longer possible. Householders adjoining the projected line were told that their houses would be burnt up by the fire thrown from the engine-chimneys; while the air around would be polluted by clouds of smoke. There would no longer be any use for horses; and if railways extended, the species would become extinguished, and oats and hay be rendered Travelling by road would be unsalable commodities. made highly dangerous, and country inns would be ruined. Boilers would burst and blow passengers to atoms. there was always this consolation to wind up with—that the weight of the locomotive would completely prevent its moving, and that railways, even if made, could never be worked by steam power!'

Still more absurd were the arguments advanced by the opponents of the Bill before the Committee of the House of Commons. They ridiculed the idea that locomotives could travel at ten miles an hour, and asserted that the smooth wheels slipped upon the rail, that the least obstacle would upset the engine. 'Suppose now,' said one of the members

of the Committee, 'suppose one of these engines to be going along a railroad at the rate of nine or ten miles an hour, and that a cow were to stray upon the line, and get in the way of the engine; would not that, think you, be a very awkward circumstance?' 'Yes,' replied Stephenson with a laughing

eye, 'very awkward indeed-for the cow!'

22. The whole weight of evidence in favour of the Bill rested with Stephenson, and here its opponents obtained an advantage, from his necessarily imperfect acquaintance with the designs of bridges, tunnels, and similar works. While on his own ground—iron railroads and locomotives—he was invincible, but he failed completely in speaking to the details of the survey. The counsel against the Bill made the most of his confused statements, and it was finally rejected by the Committee.

The projectors of the railway did not, however, lose heart. They ordered a fresh survey to be made by engineers of established celebrity, and accustomed to such work. They succeeded in warding off the hostility of some of their former antagonists. The Marquis of Stafford, who was largely interested in the Bridgewater Canal, took 1,000 of the Company's shares, and, though a steady opposition was still protracted by some of the great landowners, the Bill passed the House of Commons by a majority of eighty-eight to forty-one. In the House of Lords it met with two enemies only, and thus the sanction of the Legislature (at a cost of 27,000l.) was finally obtained for the formation of a Liverpool and Manchester Railway.

23. George Stephenson, at a salary of 1,000l. per annum—for to this he had risen from his man's wage of One Shilling per day—was appointed principal engineer, and to him was intrusted the entire superintendence of all the works necessary to the line. The monster difficulty was, Chat Moss. How was an iron road to be carried over an immense spongy peat bog, some twelve miles square in extent? A bog which supported neither horse nor man; a basin or lake of soft vegetable pulp, which could not be drained, and might never be filled up! But over Chat Moss the railway was designed to run, and Stephenson was

neither to be conquered by bogs nor Parliamentary Committees. His idea was, 'that such a road might be made to float upon the bog, simply by means of a sufficient extension of the bearing surface. As a ship or a raft capable of sustaining heavy loads floated in water, so in his opinion might a light road be floated upon a bog, which was of considerably greater consistency than water. . . . Suppose the engine to be twenty feet long and five feet wide, thus covering a surface of a hundred square feet, and, provided the bearing has been extended by means of cross sleepers supported upon a matting of heath and branches of trees, covered with a few inches of gravel, the pressure of an engine of twenty tons will be only equal to about three pounds per inch over the whole surface on which it Such, says Mr. Smiles, was George Stephenson's idea in constructing his floating road—something like an elongated raft across the Moss; and we shall see that he steadily kept it in view in carrying the work into execution.

The perseverance of the great engineer again came to his aid. The Directors of the Company quailed before the cost and the difficulty of the undertaking; engineers of eminence ridiculed its impracticability; Stephenson's own assistants despaired as day after day the work proceeded with scarce a visible result; but 'Try again!' was their master's constant injunction, and by January 1, 1830, the railroad was completed upon Chat Moss. Before the resolute energy of this self-reliant man all other impediments vanished. A long deep cutting was excavated through the red sandstone at Olive Mount; a viaduct thrown across the Sankey valley; a tunnel driven one mile and a-half under the town of Liverpool; and finally, the railway was publicly opened throughout, on September 15, 1830.* Previously, the Directors, in order to secure the best possible locomotive, had organised a public competition of engines by various makers. The prize, 500l., was gained,

^{*} The proceedings of the day were lamentably overshadowed by a fatal accident which occurred to the eminent statesman, William Huskisson, the first, and not least illustrious, railway victim.

after a severe trial, by Stephenson's 'Rocket,' which, with a weight behind it of thirteen tons, attained the then aston-

ishing speed of twenty-nine miles an hour.

24. Henceforth, Stephenson's life and energies were almost wholly devoted to the extension of the railway system. In conjunction with his son Robert, he carried out the magnificent line between London and Birmingham (opened in 1838), persevering in the face of obstacles which would have broken down the nerve and intellect of any half dozen ordinary men. At this time he was reresiding at Alton Grange, near Ashby-de-la-Zouch, in Leicestershire. His son Robert, an excellent geologist, having suggested that coal might be found on the neighbouring estate of Snibston, then advertised for sale, Stephenson purchased it, and commenced operations, pumping and boring until the coal was reached. It afterwards turned out a most profitable speculation.

Among the numerous railways with which he was more or less associated, were—the Birmingham and Derby (1839); the Sheffield and Rotherham (1839); the North Midland, from Derby to Leeds (opened in 1840); the York and North Midland, from Normanton to York (1840); and the Manchester and Leeds (1840). The vast works he carried out, and the remarkable contrivances he introduced in the construction of these important railways, were signal proofs of the fertility of his resources and the enduring freshness of his intellect. Take the North Midland alone: — it is 721 miles long, has 200 bridges and seven tunnels, measuring together 11,400 feet, or about two miles and a quarter, and cost above 3,000,000l. sterling. 'As a curiosity in construction,' says Mr. Smiles, we may mention a very delicate piece of work executed on this line at Bullbridge, in Derbyshire, where at the same point it passes over a bridge which here spans the river Amber, and under the bed of the Cromford Canal. Water, bridge, railway, and canal were thus piled one above the other, four stories high; such another curious complication probably not existing. In order to prevent the possibility of the canal breaking in upon the works of the

railroad, Mr. Stephenson had an iron tank made, 150 feet long, of the width of the canal, and exactly fitting the bottom. It was brought to the spot in three pieces, which were firmly welded together, and the trough was then floated into its place and sunk; the whole operation being completed without in the least interfering with the navigation of the canal; and the railway works underneath were then proceeded with and finished.'

25. The fame of George Stephenson, the son of the Wylam engineman, was now European, and in 1835 he was invited by the King of Belgium to lay down a system of railways for that busy little kingdom. His shrewd sense was highly appreciated by the astute sovereign, who by royal ordinance appointed him a Knight of the Order of Leopold. visited Belgium again in 1837, and dined with the King and Queen, by special invitation, at their own table at Laaken. In the following year, and in 1840, the English lines constructed under his superintendence—the Sheffield and Rotherham, Birmingham and Derby, Midland, York and North Midland, Chester and Crewe, Chester and Birkenhead, Manchester and Birmingham, Manchester and Leeds, and Maryport and Carlisle, in all 321 miles, were publicly opened. In carrying out these lines he was assisted by a corps of able engineers, trained under his own eye, and formed upon his own example—each of whom has risen to no ordinary celebrity—Joseph Locke, Thomas Gooch, John Dixon, Swanwick, and Cabrey. The revolution which these men and their illustrious master have wrought in the social conditions, the local relations, and the internal resources of England, by multiplying its channels of intercommunication, and practically annihilating the obstacles of time and space, it is only posterity that, calmly and thoughtfully contrasting what has been with what is, will be able fairly to appreciate. Justly might it be said of George Stephenson that he was, in the most honourable acceptation of the term, 'the first and greatest leveller of the age ! ' The railway system dealt a heavy blow at class distinctions and class prejudices. rejoice to see it,' exclaimed the wise and good Dr. Arnold, of Rugby, 'and to think that feudality is gone for ever; it is so great a blessing to think that any one evil is really extinct!'

26. In the year 1840, Stephenson, who was now in his sixtieth year, publicly announced his intention of withdrawing from the engineering profession, but, unable to content himself with a perfectly inactive life, he carried on mining operations at Tapton, where he now resided, on an extensive scale, and large lime-works at Ambergate, which turned out 200 tons per diem. In 1845 he made a third visit to Belgium, and was entertained at a magnificent banquet given in his honour by the principal Belgian engineers, in the public hall of Brussels. He was also received by King Leopold at a private interview. Towards the close of the year he visited France and Spain.

27. With some pictures of his daily life at Tapton, we must close our rapid sketch, acknowledging how much we have been indebted throughout to Mr. Smiles's most

attractive volume.

'It was not until the year 1845,' says Mr. Smiles, 'that he took an active interest in horticultural pursuits. Then he began to build new melon-houses, pineries, and vineries of great extent; and he now seemed as eager to excel all other growers of exotic plants in the neighbourhood as he had been to surpass the villagers of Killingworth in the production of gigantic cabbages and cauliflowers some thirty years before. He had a pine-house built sixty-eight feet in length, and a pinery 140 feet. The workmen were never idle about the garden, and the additions to the forcing houses proceeded until at length he had no fewer than ten glass forcing houses, heated with hot water, which he was one of the first to introduce in that neighbourhood. He took much pride also in his growth of cucumbers. He raised them very fine and large, but he could not make them grow straight. At last he had a number of glass cylinders made at Newcastle, for the purpose of an experiment; into these the growing cucumbers were inserted, and then he succeeded in growing them perfectly straight. Carrying one of the new products into his house one day, and exhibiting it to a party of visitors, he told them of the expedient he had

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adopted, and added gleefully, "I think I have bothered them now!"

Stephenson's old partiality for birds and animals now manifested itself very vividly. He knew every bird's nest on his grounds, and had his pet dogs, pet cows, pet rabbits and pet horses. He was not much given to reading: he had learned to read at too late an age for reading to become a pleasure. He dictated almost all his letters, being averse to writing. Conversation was his greatest amusement, and he eagerly sought the society of intelligent persons.

28. His hospitality was characteristically thorough, and to young men of promise he was always ready to lend a helping hand. He not only gave them aid but counsel. His religious feelings were deep and earnest, but never loudly professed. He was no arrogant parvenu; he never lost sight of—never was ashamed of—his ignoble origin, and delighted in reminding his pupils that the secret of his successful career was simply perseverance. To the poor he was a most generous friend. For the afflicted his sympathy was always quick and active. He retained to the last his astonishing vigour of thought, plenitude of resources, clearness of conception, and fertility of invention; a brave, earnest, heroic English worker, whose life has something truly epical in its most noble simplicity.

Such was George Stephenson, the father of the English Railway System. He died of intermittent fever, on August 12, 1848, in the sixty-seventh year of his age.

THE POTTER'S ART.

1. Among those arts of the ancients which they carried to perfection, but which, during the fatal darkness of the middle ages, sank, not only into decay but even into entire oblivion, was the manufacture of enamelled and painted vases, and other vessels of earthenware—as graceful in form as they were rich in embellishment! Not a jug but was meet to be handled by a Naiad; not a cup that was unworthy to touch a Hebe's lips! Strangers wandering through

the towns and villages of Italy occasionally met with one of these beautiful relics of the Greek genius or the Etruscan skill. Voyagers who had ventured as far as Egypt saw with wonder the costly workmanship of the Egyptian potter. From China—through various channels—came at intervals the most precious specimens of luminous kaolin, or porcelain. But in Europe the art was lost or forgotten; the secret of the manufacture had passed from the memory of men. There were skilful workers in gold and silver, but none who could give to clay an artistic shape, or clothe it in the light and warmth of Colour.

2. Luca della Robbia, an eminent Florentine sculptor, was one of the first inquirers after the vanished art. Bred to the trade of a goldsmith, his genius inclined him to the profession of a sculptor, and he applied himself to his adopted studies with all the love and enthusiasm of a true artistic nature. His chisel was seldom idle; he wrought at his work far into the night-hours; and, being unable in the winter-time to afford the luxury of a fire, he placed his feet in a basket of shavings to afford them warmth. Such resolution, so single-minded a devotion to one steady aim, commanded success. Luca obtained wealth, and, what he valued more, fame. Both in bronze and marble he executed numerous commissions. But, comparing the labour he expended upon an image of bronze with the payment he received for it, he was induced to look around for a material of greater plasticity, and decided upon working in clay. Studying with characteristic perseverance its properties, he succeeded at last in the invention of a glaze, or enamel, which enhanced the beauty while it increased the durability of his work. Further application revealed the secret of colouring this enamel, and Della Robbia's beautiful productions, resplendent now in the azure of the skies, the purple of the hyacinth, and the golden glow of the orange, were the admiration of kings and nobles. Up to the date of his death his commissions continued to increase, and his ers after him carried on, for years, the lucrative

as probably one of their productions that stimu-

lated the imagination of the famous Bernard de Palissy, whose self-denial and unconquerable perseverance opened to his country a manufacture of the most profitable character. The life of this great discoverer is so remarkable an illustration of our theme, so signal an example of success won by earnest devotion to a steady aim, that we cannot refuse to epitomise it in these pages.

BERNARD DE PALISSY,

THE FRENCH POTTER.

1. Bernard de Palissy was born at Agen, of poor parents, early in the sixteenth century. He was yet a boy when his quickness and intellectual precocity attracted the attention of a land-surveyor, who willingly received him Employed to draw and colour the as an apprentice. surveys, his latent love of art was quickly developed, and from plans of estates and buildings his ready talent soared to copies of the masterpieces of the great painters. These were so admirably executed as to engage the favourable notice of some liberal connoisseurs, who employed the young artist in painting designs upon glass. His reputation widened daily; from all parts of the country he received commissions; and in the travels through France which these commissions necessitated, his active intellect devoted itself to the study of natural objects. This led him onwards to the acquisition of chemical knowledge, that he might the better understand the properties and qualities of the minerals and earths he met with.

After this arduous apprenticeship he settled himself quietly at Saintes, married, and sedulously applied himself to the profession of a painter. But, as his family increased, his labours could barely supply them with a scanty support, and the heart of the industrious workman often sank within him, contemplating a future of cloud and shadow.

2. One day there was shown to him a richly-enamelled cup of Italian manufacture; perhaps the work, as we have said, of one of Luca della Robbia's descendants. The art

of enamelling was at this time entirely unknown in France. and the idea immediately occurred to Palissy that, if he could but discover the secret of making these cups, he should secure a fortune for his family, and his unavailing toils would be at an end. 'Regardless,' he says, 'of the fact that I had no knowledge of clays, I began to seek for these enamels as a man gropes in the dark. I reflected that God had gifted me with some knowledge of drawing, and I took courage in my heart, and besought Him to

give me wisdom and skill.'

3. Did we not know that real life is thronged with incidents of deeper interest than those of fiction, we might have supposed the tale of Palissy's trials to be the romance of some imaginative brain. He has himself recorded it in stirring language, and no man of sensibility can read the narrative without emotion. He tells us that at first his resources were so scanty that he could barely prosecute the most trivial experiments. But, happily, having received a considerable sum of money for work which he had completed, a portion was immediately expended in the purchase of a quantity of carthen pots. These he broke into fragments, and, covering each with a chemical compound, baked them in a rudely-constructed furnace, in the hope of discovering that white enamel which was the great secret of the Italian manufacture. Disappointed in his first attempt, he was not discouraged; altering the ingredients he made use of, he again repeated the experiment, but still without success. He changed the proportions in which they were combined; he applied them separately; he chose clays of different qualities; he increased or diminished the heat to which they were exposed; but all in vain. Like the alchemists, his contemporaries, he expended his substance in the pursuit of what appeared an unconquerable mystery. He was so wholly absorbed in his labour, that it was only at intervals he practised his painting and land-surveying, and so procured a scanty subsistence. His wife grew pale with want; his children sickened; their constant cry was 'Bread! Bread!' But Palissy did not yield. He knew the goal was far distant; but that goal meant fame and fortune, and so—he persevered. The sufferings he himself endured—hope deferred, consuming anxiety, unceasing toil—he bore in silence, for neither from wife nor friend could he expect the consolations of sympathy. 'With sorrows and sighs,' he says, 'I was every day pounding and grinding new materials and constructing new furnaces, which cost much money, and consumed my wood and my time.'

Two years having thus elapsed in fruitless labours, it occurred to Palissy that the defect might lay in the furnace, which, being of his own construction, was necessarily rude and imperfect. He therefore purchased a further supply of pots; again shaftered them into fragments; again dipped them in chemical compounds; and sent them to a neighbouring kiln to be properly fired. Another failure! The ingredients were altered in character and proportions, and a second time the kiln was resorted to. the white enamel remained undiscovered. With much loss of time, with sorrow and confusion, and at a great expense, Palissy persevered in his experiments, until literal ruin stared him in the face. His wife and children suffered bitterly from cold and hunger, but the would-be discoverer, absorbed in his dreams, in his hopes, in his glowing imaginations—his soul lit up with the light of one over-mastering desire—was insensible to pinching famine and winter-winds.

4. It happened, at this juncture, that the King's Commissioners visited the district of Saintonges for the purpose of assessing it to the gabelle, or salt-tax, and Palissy, whose skill as a land-surveyor was well known, obtained the task of surveying the salt-marshes in the vicinage. The appointment was lucrative, and comfort and plenty once more prevailed in the potter's house. But, the work ended, Palissy returned to his dreams—to his pots and his furnace—to his apparently hopeless pursuit of 'the secret of enamels.' Two years more were abandoned to this labour. Day after day he journeyed to the kiln, and day after day returned unsuccessful. His neighbours ridiculed him, as the world always ridicules the heroic spirits it cannot

comprehend; his wife upbraided him with bitter reproaches, until Palissy could no longer remain unmoved. One trial more, he said, and, if defeated, he would yield up his hopes for ever. This final experiment he made upon as large a scale as his means would command, and 'God willed,' he says, 'that when I had begun to lose my courage, and was gone for the last time to a glass-furnace, having a man with me carrying more than three hundred pieces, there was one among those pieces which was melted within four hours after it had been placed in the furnace, which trial turned out white and polished, in a way that caused me such joy as made me think I was become a new creature.' He rushed home breathless and excited, crying, like Archimedes when he had tested Hiero's crown, 'I have found it! I have found it!'

5. This bright ray of success encouraged Palissy to persevere in his exertions. He had discovered the composition of the enamel; the next step was to ascertain how it should be applied. But this part of his enterprise must necessarily be undertaken at home, lest the unscrupulous should rob him of the results of his arduous labours. So he built himself a furnace in imitation of the one at the pottery. Next he fashioned vessels of clay from his own designs. Then he ground and otherwise prepared the composition of his enamel—a task which consumed his days and nights for several weeks. Finally, he lit his furnace fire, and placed therein the vessels duly coated.

Fortune is within his reach; the crown of his years of toil is almost in his grasp. Heap on more wood! Let not the furnace fail in heat, now that the end is at hand. Heed not the cost—wood, wood, wood! In fuel for that blazing, roaring, seething furnace lies the magic of success. Palissy watches there with hungry eyes, and piles the logs upon the fire. More wood! But yet the powder will not fuse—the enamel will not melt! Hither comes his son with the morning meal, for already one night has vanished into the past. He eats his simple fare with hurried cagerness, for he must tend the ever-craving furnace; and besides, this black bread—this cup of water—what a repast,

methinks, for a man who in an hour or two will command the potentiality of wealth! An hour or two?—Lo, the morning passes; the noon wanes into twilight; the dusk deepens into night-darkness; and still the furnace demands more fuel, and still the enamel will not melt!

The third day rises on that seething furnace, and on the pale, worn watcher bending wearily over it. The fourth, the fifth, have come and gone, and a sixth is added to the fruitless labour. 'I was now,' writes Palissy, 'like a man in desperation, and, although quite stupified with toil, I took thought with myself that haply there might be some error in the mixture. So again I began to grind and pound my materials, all the time letting not my furnace cool. Thus my task was twofold, for I had to pound and grind, and yet to keep up my fire. I was also constrained to go and purchase other vessels, that my new compound might be tested—having lost all the vessels of my own making. And so having covered these pieces with the said enamel, I put them in the furnace, still maintaining the fire at its utmost height.'

6. But now his fuel was exhausted, nor had he money wherewith to purchase more. No fuel, no money, when now the Rainbow of Promise broadened so brightly over him, and the long dream was at last verging upon reality! Away sped the despairing adventurer into his little garden. He rent to pieces the trellis where clambered his vines; he tore up with eager hands the seats, and arbour work, and palings. Once more the furnace blazed right merrily, and once more it waned and flickered. Then he broke up his table, his chairs—pulled down the very door from its hinges—even the flooring of his room fell a sacrifice to that remorseless fire. And yet the enamel would not melt!

'And now,' he writes, 'I suffered an anguish that I cannot speak, for I was quite exhausted and dried up by the heat of the furnace. Further to console me, I was the butt of everybody's ridicule. Even those from whom I had a right to expect sympathy, ran through the town exclaiming that I was burning my very house. In this

way I lost my credit, and was looked upon by all as a madman.'

The persevering inventor made yet another effort. To secure the services of a skilled potter, he gave him the clothes off his back, and, his resolute ardour attracting the admiration of one of his fellow-townsmen, he was fortunate enough to receive pecuniary aid. The furnace, however, was of imperfect construction, and at the very moment that Palissy had mixed the ingredients aright and made the enamel fusible, it burst with the excessive heat, and its flinty splinters adhered to the vessels. He was nevertheless offered a fair price for even this imperfect ware, but, with the noble pride of a true artist, refused to suffer such unworthy specimens of his skill to go abroad to the world.

- 7. But he had now discovered the mystery, and success dawned upon his courageous exertions. The Duc de Montmorency patronised him liberally, and introduced him to the king, Charles IX., who had the taste to appreciate his genius and the nobility of his character. He was appointed the King's Potter; commissions flowed in upon him apace. And, reviewing the events of sixteen weary years, he came to this just conclusion:—'I have found nothing better than to observe the counsel of God, His edicts, statutes, and ordinances; and in regard to His will, I have seen that He has commanded His followers to eat bread by the labour of their bodies, and to multiply their talents which He has committed to them.'
- 8. Soon afterwards Palissy became a Huguenot, embracing with his characteristic ardour the principles of the Reformed faith. He not only became himself a believer, but sought to impress his belief upon others. Every Sabbath he assembled round him the ignorant artisans of Saintes, or the equally ignorant peasants of the neighbouring villages, and preached and expounded to them the Word of God in all its unadorned simplicity. The priests of the Roman Church did not suffer him long to prosecute his Christian labours uninterrupted. It is true that the patronage and countenance of the king, who forgot the horetic in the artist, saved him from the prison and the

stake, but the priests secretly exerted against him the prejudices of the mob, and his house was sacked, his atelier devastated, and a large quantity of admirable pottery destroyed. The king now interfered, and summoned him to Paris as a servant of his own; thus preserving at once the life of the artist, and of the art which he had invented. Sheltered by the favour of Charles IX. and Catharine de Medici, he escaped the terrible massacre of St. Bartholomew; but, when the League of the Holy Trinity was formed, became exposed to the fatal imputation of heresy, and even the influence of the monarch proved insufficient to save him from the Bastille (A.D. 1584). He was now an octogenarian; but his spirit was as resolute as in the days of his early manhood. 'My good friend,' Henry III. said to him, 'if you do not consent to renounce your Huguenot creed, I shall be compelled to leave you in your enemies' hands.' 'Sire,' nobly answered Palissy, 'those who compel you, a king, can never compel me, a subject, because I know how to die.

He remained a Huguenot, and a prisoner, until his death in 1590, when he was about 86 years old.

9. Palissy was something more than an enameller of pottery. Like all men of genius, while devoting himself in the main to one pursuit, he did not forget to embrace other branches of learning. His knowledge of natural history was surprising, and he was both theoretically and practically an admirable chemist. He was the first, it is said, to enunciate the principles on which the operations of a fountain are based. His life was pure and stainless; the life of a true Christian, an honourable man, and a great artist; and France has just reason to be proud of having given birth to a son so noble as Bernard De Palissy.

JOSIAH WEDGWOOD,

THE ENGLISH POTTER.

1. What Palissy achieved for France, Wedgwood achieved for England, and even with greater success — the

ware of our Staffordshire potteries having a far wider circulation, and creating an infinitely greater demand, than the ceramic manufactures of the French.

Josiah Wedgwood was born at the village of Burslem, near Newcastle-under-Lyne, in 1730. His father was a poor potter, who earned but a barren livelihood at his trade, and eked it out by farming a scanty plot of ground. He died when Josiah was eleven years old, and the lad, thus thrown upon the protection of an elder brother, began to work as 'a thrower' at his brother's wheel. He was soon afterwards afflicted by an attack of malignant smallpox, from which he with difficulty recovered. The disease, driven from the citadel, retired into the outworks, and settled in the unfortunate artisan's left leg, compelling a resort to amputation. Being thus disabled for the potter's wheel, the young Wedgwood looked around him for work to do. He had already displayed a correct taste in devising patterns for articles manufactured in the coarse earthenware of Staffordshire. We find him, therefore, after awhile, settled at Stoke, in partnership first with a man named Harrison, and afterwards with another named Whieldon, busily designing earthenware knife-handles in imitation of agate and tortoiseshell, jugs, plates, pickle-dishes, and similar articles, and giving to each a superiority of form and workmanship which attracted the attention of the public. But Whieldon having an aversion to the ornamental, from his own inability to plan or design, soon disagreed with Wedgwood; and the latter returned to Burslem, where he prosecuted the new trade he had so fortunately opened up, with invincible ardour. Everything he did, he endeavoured to do well, and bestowed the same amount of care on a common saucer as on a jug of ambitious outline. Soon he became an employer as well as a workman, and his trade increased so largely that he was constrained to engage several assistants. But his whole heart was in his work; he devoted all his thought and energy to its progressive improvement, and suffered no imperfect article to leave his ateliers.

2. Having improved upon the ware previously manufactured in England, as far as 'form' and 'pattern' were

concerned, his active mind now engaged in a search for some better 'material.' He saw that the continental potteries produced a ware of superior quality, and had, therefore, the command of the English market. If earthenware was to become a staple manufacture in England, to compete with the ceramic productions of the French, it was evident that a better clay must be made use of. He accordingly tested the different earths in the neighbouring countryside, and, after a succession of disappointments, happened upon one which was black before it entered the furnace, but quitted the fiery ordeal a lustrous and beautiful white. This earth contained silica. By mixing silica (in the shape of flints reduced to powder) with the red earth employed in the potteries, he produced a compound which became white after calcination. So far he had won success. His next step was to vitrify the white earthenware with a transparent glaze. Thus he obtained a material equal in purity and clearness to the product of the continental potters, while he placed at the disposal of his country a manufacture of the highest commercial value and most extensive utility. English earthenware is now, indeed, in demand all over the world, and has even beaten out of the French markets the staple of the French artisans. 'Its excellent workmanship, its solidity, the advantage which it possesses of sustaining the action of fire, its fine glaze—impenetrable to acids—the beauty and convenience of its form, and the cheapness of its price, have given rise to a commerce so active and universal, that in travelling from Paris to Petersburg, from Amsterdam to the furthest point of Sweden, and from Dunkirk to the extremity of the south of France, one is served at every inn with Wedgwood ware. Portugal, and Italy are supplied with it, and vessels are loaded with it for the East Indies, the West Indies, and the continent of America.

3. The successful potter now commenced the manufacture of white stoneware on an extensive scale, and still continuing his earnest efforts at further improvement, soon afterwards introduced a cream-coloured ware, which met with many admirers. To assist him in his laborious

investigations, he studied chemistry, and carefully prosecuted a series of nice experiments. Increasing wealth and growing fame brought him into contact with men of science and learning, from whom, like a true learner, he managed to extract much of the information he required. Having manufactured for Queen Charlotte a service for the royal table, the first ever made of English ware, he was appointed the Royal Potter: a title more prized by Wedgwood than all the quarterings of a German escutcheon—and the ware was henceforth designated the 'Queen's Ware.' While chiefly manufacturing articles of utility, his refined taste did not permit him to neglect the beautiful, and he was constantly labouring to improve the designs and enrich the embellishments of his pottery. He succeeded in producing the most exquisite imitations of Greek, Etruscan, and Egyptian vases, and admirable copies of intaglios, cameos, medallions, or ancient tablets. Works of art, hitherto known only to a few, were thus made familiar to the many. Beauty of form and harmony of colour were actually popularised in England, and we doubt whether the full benefit of Wedgwood's patriotic exertions in this way has ever been properly appreciated. Valuable sets of porcelain were frequently placed in his hands for imitation. The copies were often so finely executed as positively to excel the original. Relics of ancient art, brought by Sir William Hamilton from the exhumed city of Pompeii, were imitated with wonderful accuracy and finish. When the famous Barberini Vase was for sale, Wedgwood, desirous of copying it, competed for its purchase with the Duchess of Portland. For this 'thing of beauty,' which, as the poet says, is truly 'a joy for ever,' he bid as high as 1,700 guineas, and only desisted on a promise from the duchess that she would lend it to him for the purpose he required. The duchess, having become the possessor of the vase (which is now in the British Museum) for 1,800 guineas, faithfully kept her word, and Wedgwood produced fifty copies of it, which he sold for 50 guineas each, and yet was a considerable loser by the undertaking.

4. He was always on the look-out for talent which he

could make use of, and always ready to pay liberally for its use. Having been informed of Flaxman's originality of genius, he sought the obscure student, and addressed him with his usual directness: 'Well, my lad, they tell me that you are a good draughtsman, and a skilful designer. I'm a manufacturer of pots—name Wedgwood. Now, I want you to design some models for me—nothing fantastic, but simple, tasteful, and accurate in drawing. I'll pay you well. Do you think the work beneath you?' 'By no means, sir,' rejoined the young sculptor, 'indeed, the work is quite to my taste. Give me a few days. Then call again, and you will be able to see what I can do.' 'That's right-work away. Mind, I am in want of them at once. They are for pots of all kinds—teapots, jugs, teacups, and saucers. But, especially, I want designs for a table-service. Begin with that. I mean to supply one for the royal table. Now, think of that, young man. What you design is meant for the eyes of royalty! 'I will do my best, sir, I assure you,' replied the hopeful sculptor.

He did his best, and Flaxman's best was scarce inferior to the accomplishments of Greek Art. From Homer, and Virgil; from the fantastic mythology of the Old World; from the spirit-stirring chronicles of Ancient History; from the sublime inspiration of Scripture; the young artist obtained the subjects which he modelled in low relief small groups and single figures of exquisite simplicity and grace. For examples of form he studied the Etruscan vases, or the Greek outlines furnished in Stuart's elaborate work on 'Athens,' and these he adorned with the rich conceptions of his own classic imagination. Wedgwood, who possessed a true artistic sympathy with the pure and beautiful, was delighted with the results of Flaxman's labours, and this connection between them lasted for many years to their mutual benefit, as well as to the great advantage of 'the million,' who were thus provided, at a cheap rate, with examples of form and colour, with works of fancy and imagination, which insensibly educated their taste, and cultivated their judgment. For no soul can be utterly dead to the influence of the Beautiful, or can live in its presence without becoming purer and happier; without storing up sweet memories and precious fancies for its comfort when the cloud and the shadow fall upon it.

A thing of beauty is a joy for ever;
Its loveliness increases; it will never
Pass into nothingness.

—Keats.

- 5. By efforts such as these, directed by a taste so judicious and a liberality so princely, Wedgwood elevated the manufacture of pottery from a position of the meanest character to the level of the great staples of England. And instead of importing for our own use the productions of the Continental potteries, we soon obtained the command of the European markets, and supplied them with Wedgwood ware in the face of heavy protective duties. Our potters now dare to compete with the skilled artisans of the native Their jugs and cups, and their basins land of porcelain. and dishes, supply the wants of the American backwoodsman, as well as of the Australian sheep-farmer. You will find them in the cafes of Paris, the huts of Switzerland, and the casas of Mexico. In thirty years after the Burslem potter began his noble labours, the number of hands directly employed in the manufacture rose to 20,000, and probably it now exceeds a quarter of a million! Was not Josiah Wedgwood a benefactor to his country? Is not such a man worthy of the love and admiration of posterity?
- 6. Wedgwood's life was one of zealous devotion to the manufacture he may be said to have created. By well-directed experiments he discovered the long-lost secret of the Etruscans, the art of painting on articles of porcelain or earthenware. He invented the pyrometer, to ascertain the gradations of heat in a furnace. Mainly through his support and exertions, the Trent and Mersey canal was constructed, which completed the navigable communication between the east and west coasts of the island, and facilitated access to, and transit from, the pottery district. Still further to promote the latter object, he made, at his own expense, an excellent turnpike road ten miles in length, traversing the principal potteries; and always

ious to ensure the comfort and happiness of his work-

people, he built a village of commodious cottages, which he called Etruria, and in its neighbourhood established his

principal factories.

After a life of successful industry and honourable perseverance, rich in the love and esteem of his countrymen, Josiah Wedgwood passed away from the world, of which such men as he are verily the savour and vitality, on January 3, 1795, in his sixty-sixth year, leaving an immense fortune as the visible evidence of his industry.

perseverance, and prudent enterprise.

7. The mantle of Wedgwood fell worthily upon the late Mr. Herbert Minton, who, though neither an inventor nor a discoverer, possessed remarkable powers of businessorganisation, a ceaseless energy, and an indomitable activity. He was a man whom difficulties could not weary, nor obstacles discourage. His steady aim in life was the development of the manufacture he had adopted, and he concentrated all his faculties upon the successful achievement of this particular object.

8. A brief sketch of his life and career is afforded by Mr. Smiles, in his admirable volume on 'Self Help,' and as an illustration of the maxim which we are endeavouring

in these pages to enforce, may here be fitly quoted.

9. 'He possessed a clear head, a strong body, rare powers of observation, and great endurance; he was, besides, possessed by that pride and love of his calling without which so much perseverance and devotion to it could scarcely have been looked for. Withal he was kindly and genial, commanding hosts of friends and cooperators; his rivals themselves regarding him with admiration, and looking up to him as the prince of his order. Like Wedgwood, he employed first-rate artists—painters in enamel, sculptors, designers of flowers and figures—and sparing neither pains nor expense in securing the best workmen, whether English or foreign. The talents of the men employed by him were carefully discriminated and duly recognised, and merit felt stimulated by the hope of promotion and reward. The result soon was, that articles of taste, which had formerly been of altogether exceptional production, became objects of ordinary supply and demand; and objects of great artistic beauty, the designs of which were supplied by the best artists, were placed within reach of persons of moderate means. The quality of the articles manufactured at his works became so proverbial, that one day when Pickford's carrier rudely delivered a package from his cart at the hall-door of an exhibition of ceramic manufactures, and the officer in waiting expostulated with the man on his incautious handling of the package, his ready answer was, "Oh, never fear, Sir; it's Minton's; it won't break."

10. 'It is not a little remarkable that Mr. Minton, by his unaided energy and enterprise, and at his own risk, was enabled successfully to compete with the Sèvres manufactures of France, which are produced by the cooperation of a large number of talented men, and the assistance of almost unlimited state funds. In many of the articles exhibited at Paris in 1855, Mr. Minton's even excelled those of similar character produced at the imperial manufactory. In hard porcelain, also, he outvied the best specimens of Meissen and Berlin ware; in Parian, he was only approached by Copeland; whilst in the manufacture of encaustic tiles he stood without a rival. In perfecting these several branches, Mr. Minton had many difficulties to encounter and failures to surmount, but with true English energy and determination to succeed, he surmounted them all, and at length left even the best of the ancient tiles far behind. Like Wedgwood, he elevated the public taste, introduced beautiful objects of art into the homes of the people, and by founding new branches of industry, mainly by his energy and ability, he nobly carned the claim to be regarded as a great national benefactor.

11. 'Men such as these are fairly entitled to rank among the heroes of England. Their patient self-reliance amidst trials and difficulties, their courage and perseverance in the pursuit of worthy aims and purposes, are no less heroic of their kind than the bravery and devotion of the soldier and the sailor, whose duty and whose pride it is heroically to

fend what these valiant leaders of industry have as sically achieved.'

THE COTTON MANUFACTURE.

- 1. England had been for four or five centuries a manufacturing country before cottons were included among the staples of its national industry. The manufacture of cotton goods was introduced into Italy about the close of the 15th century, but did not extend its fructifying influence to England for nearly two hundred years later. It took firm root at once, and as early as 1641 our Manchester cottons were sent into foreign parts, and there exchanged for the raw material.
- 2. It did not make its way, however, without considerable opposition. The wool-combers were wroth that their monopoly should be invaded, and the cry, so dangerous in England, of 'vested rights,' rang loudly through To bring cotton into disrepute, the weavers caused the malefactors hung at the gallows to be attired for their death-garb in the obnoxious fabric, and one of these unhappy wretches, who, in the course of his illspent life had been a weaver, took occasion to address the crowd assembled round his scaffold thus: -- 'Consider, good Christians,' said this model protectionist, 'consider that if you go on to suppress your own goods by wearing such cottons as I am now clothed in, you will bring your country into misery, which will consequently swarm with such unhappy malefactors as your present object is, and the blood of every miserable felon that will hang after this warning from the gallows, will lie at your doors!'

In the face of an hostility so ignorant, the cotton manufacture in England, nevertheless, continued to prosper, the produce being mostly consumed at home. The weft of cotton, however, was only used in English cottons, the warp being made of linen, because it was supposed to be impossible to spin a cotton-twist sufficiently durable for the latter purpose. The chief seat of the manufacture was Lancashire, where had settled some Flemish emigrants, driven from their own busy country by political persecution; but it also flourished in Essex, and from Essex came the first great impetus of its prosperity.

- 3. Up to so late a date as 1733, the only process known to the English weavers was that of spinning between the finger and thumb, one thread at a time; and weaving up the varn in a loom, whose shuttle was flung from right to left, and left to right, by both hands alternately. occurred to one John Kay, a loom-maker, of Colchester, that this method was susceptible of being simplified, and after much laborious thought, and several years of fruitless experiment, he invented the 'fly-shuttle,' which, by means of a handle and spring, could be easily worked with one hand. Alas, for the folly of inventors! Kay was immediately beset by a host of enemies. The workmen inveighed against his machine because they thought it would curtail their profits; the masters employed every imaginable artifice to copy it without paying Kay his legitimate reward. He attempted to establish his rights, and appealed to the courts of law, but speedily found that litigation was a luxury reserved for the rich. Anxious to retrieve himself, he enlarged his ideas of mechanism, and constructed a power-loom of rude design. When tidings of this new invention got abroad, the mob surrounded Kay's house, forced an entrance, destroyed the machine, and all else upon which they could lay their hands. was with difficulty that Kay himself escaped from their fury, and contrived to make his way to Paris, where he died in extreme poverty a few months later.
- 4. Kay's invention, by degrees, was everywhere adopted, and it so far facilitated the process of weaving, that the loom soon got ahead of the spinning-wheel. The weavers complained that their time was wasted in searching for materials with which to work. The supply of yarn was utterly insufficient for the daily operations of the loom. So invention now was busy with improvements in the spinning wheel, and amongst other active speculators, James Hargreaves, of Standhill, near Blackburn, hit upon a most ingenious device. It is said that he was sitting in his cottage one day, idle for want of yarn, and meditating on the best method for supplying the deficiencies of hand-wheel, when his wife overturned the rude and

rough apparatus at which she was working. Lying on its side, the wheel still continued its rotatory motion, the spindle from a horizontal being cast into a perpendicular position. Hargreaves at once conceived that the problem would be solved if he could contrive to place a number of spindles side by side, and work them by one agency. There were many obstacles in the way of his carrying out his idea, but he resolutely persevered, and after three years of labour and experience, succeeded in constructing a machine, where one horizontal wheel set in motion eight spindles, which, in honour of his wife, he christened the 'Spinning Jenny.' As soon as the weavers of Blackburn obtained intelligence of this new machine—this accursed invention that was to throw, as they imagined, seven out of every eight artisans out of employment—they broke into open riot, surrounded the inventor's cottage, shattered his ingenious contrivance into fragments, and constrained him to fly for his life to Nottingham. He took out a patent, but was then beset by the avaricious enmity of the manufacturers, who were willing enough to make use of the invention, but indisposed to compensate the inventor. Baffled, dispirited, and poverty-stricken, he finally abandoned the hopeless struggle, and a decade after he had given to the Lancashire magnates the wealthmultiplying resources of Spinning Jenny, died in obscurity and extreme indigence.

His invention did not die with him. The good that men do lives after them, and a great idea fructifies for centuries when the thinker who conceived it has passed away.

SIR RICHARD ARKWRIGHT.

1. One of the most illustrious of the founders of the commercial greatness of the British empire was undoubtedly Richard Arkwright, born at Preston, in Lancashire, on the 23rd of December, 1732. Like most of our English heroes of labour—our members of the noble chivalry of work—Arkwright was the son of pauper parents, and his

success in life was wholly due to the energy and perseverance with which he concentrated his powers on the attainment of one cherished object. Indeed, we may premise, at the outset of our narrative, that Arkwright was not a man of genius. He possessed, it is true, a certain faculty of invention, and an innate aptitude for mechanics; but the fame he won, and the fortune he amassed, were rather the spolia opima of unremitting industry and undaunted resolution, than the prizes of a bold and daring intellect.

2. Arkwright received but a scanty education, for he was the youngest of thirteen children, and probably a very limited amount of reading and writing was considered sufficient for one whose lot in life was marked out to be that of a barber. When he commenced his labours in that important trade is uncertain; but we know that he prosecuted them with varying success until he was about thirty years of age. His shop was situated in a cellar in one of the obscurest alleys of Bolton, and his occupation was indicated by a blue and white pole, to which was affixed an engraved tin-plate, inviting the passing stranger to step downstairs, and have his hair cut or his chin 'reaped' in admirable style. Neither the pole nor the plate attracted many patrons, until, at last, the felicitous idea occurred to Arkwright of compelling the attention of the crowd by a brilliant placard, which bore, in Brobdignagian letters, the following inscription: —

'COME TO THE SUBTERRANEOUS BARBER! HE SHAVES FOR A PENNY!!'

3. Now, Preston rejoiced in many barbers, but in only one subterraneous barber: the legitimate charge, moreover, for a 'clean shave,' was invariably twopence. Hence, the twofold attraction of a reduced rate and a polysyllabic epithet proved too much for the 'great unshaved' of Preston. They flocked in crowds to Arkwright's cellar, and ras the business which he now enjoyed, that wals, in order to retain but a tithe of their , were also compelled to reduce their ht, in the true spirit of modern business,

then lowered his charge to one halfpenny, and so maintained his reputation as the cheapest barber in the county.

About the year 1760, Arkwright abandoned his cellar, and began business as an itinerant dealer in hair, travelling to and fro to collect the material, and then, after he himself had dressed it, disposing of it to the wigmakers. His ingenuity invented some methods of preparing the hair which soon attracted the attention of his customers, and having discovered the secret of dyeing it in a particular manner, his connection rapidly increased, and became very lucrative. He was soon the proprietor of a little 'independence,' and, therefore, felt justified in marrying.

4. His early liking for mechanical pursuits, time and opportunity had ripened into a passion, and like other speculators, he commenced his experiments by a vain attempt to solve the hopeless problem of Perpetual Motion. Requiring some wheels of nice construction for his projected apparatus, his enquiries introduced him (about 1767) to one James Kay, a clockmaker of Warrington, from whom he undoubtedly received considerable assistance in his experiments, and with whom he remained connected for many years.

5. It was about this time that the cotton manufacture of England began to show signs of a vast development, and both America and Europe bought largely the products of her power-looms. In Lancashire alone 50,000 spindles were at work daily, but the amount they produced was totally inadequate to the demand, nor could they possibly keep employed the numerous cotton-mills. The weavers, in those days, generally depended on their wives and daughters for a supply of west, and those whose families could not furnish an adequate quantity, were constrained to employ their neighbours in spinning for them, and consequently to pay a higher price than their masters allowed. It was no uncommon thing for a weaver to walk three or four miles in a morning, and call on five or six spinners, before he could collect weft to serve him for the remainder of the day: and when he wished to weave a piece in a shorter time than usual, a new ribbon or gown was necessary to quicken the exertions of the spinner.'

6. The want existing, attempts were naturally made to supply it, and the ingenuity of various mechanisms was directed to the best way of increasing the productive power of the hand-wheel. A Mr. Wyatt invented an apparatus for the purpose in 1733; a Mr. Earnshaw in 1753; and Hargreaves, as we have already shown, in 1767. The 'spinning-jenny' of the latter, as Arkwright himself acknowledged, furnished him with an important part of his own invention, and it was within a year of its production that Arkwright, with Kay, the Warrington clock-maker, again appeared in Preston, and commenced the construction of a machine for spinning cotton thread, of which they brought with them a model. Mr. Smalley, a liquor-merchant and a painter of Preston, who had retired from business with a small independence, was also connected with the speculation, and the use of the room in which their machine was fixed—the parlour of the house attached to the Free Grammar Schools — was granted by Mr. Smalley's friend, the schoolmaster. 'At this time Arkwright was so poor,' says Mr. Craik, 'that, an election having taken place in the town, of which he was a burgess, it is asserted that his friends or party were obliged to subscribe to get him a decent suit of clothes before they could bring him into the poll-room.' His experiments in connection with his machine had, in fact, reduced him to beggary. To purchase materials for his models he had parted with all his furniture and stock, and expended all his savings, and his wife grew so incensed at what she considered a senseless expenditure that, at last, she cast down his models on the floor, and shattered them into pieces. Wroth at this unfeeling outrage, Arkwright separated from her.

7. Having reason to apprehend from the Preston spinners an outbreak such as had ruined the unfortunate Hargreaves, Arkwright and Kay betook themselves to Nottingham. Here, too, they found it no easy matter to obtain the assistance of capitalists in what appeared a peculiarly hazardous speculation. A small sum was ad-

ed by Messrs. Wright, the bankers, but they speedily ed of their liberality, and refused any further aid.

The model was next exhibited to Messrs. Need and Strutt, the eminent stocking-weavers, and, fortunately the latter was a man of talent and ingenuity, well fitted to pronounce an intelligent opinion upon it. He immediately appreciated its capabilities, and, with his partner, agreed to associate themselves in Arkwright's enterprise. A patent was accordingly taken out, in 1769, to secure the inventor's rights, and a spinning-mill, provided with these frames, and driven by horse-power, was erected. In 1771, the firm established a mill at Cromford, in Derbyshire, set in motion by a water-wheel, and in 1775, Arkwright, having effected numerous improvements, took out another patent.

In his second specification, the inventor enumerated, among the various parts of his machinery, no fewer than ten different contrivances. Of these the most important, and that which he particularly claimed as his own invention — for he frankly admitted that in other parts he had but improved upon the labours of his predecessors, and especially upon the 'spinning jenny' of Hargreaves - was a method of drawing out the cotton from a coarse to a finer and harder-twisted thread, and so rendering it fit to be used for warp as well as weft. 'This was most ingeniously managed by the application of a principle which had not yet been introduced in any other mechanical operation. The cotton was in the first place drawn off from the skewers on which it was fixed by one pair of rollers, which were made to move at a comparatively slow rate, and which formed it into threads of the first and coarser quality; but at a little distance behind the first was placed a second pair of rollers, revolving three, four, or five times as fast, which took it up when it had passed through the others, the effect of which would be to reduce the thread to a degree of fineness so many times greater than that which it originally had. The first pair of rollers might be regarded as the feeders of the second, which would receive no more than the others sent to them; and that, again, could be no more than these others themselves took up from the skewers. As the second pair of rollers, therefore, revolved, we will say, five times for every one revolution of the first pair, or,

which is the same thing, required for their consumption in a given time five times the length of thread that the first did, they could obviously only obtain so much length by drawing out the common portion of cotton into thread of five times the original fineness. Nothing could be more beautiful or more effective than this contrivance, which, with an additional provision for giving the proper twist to the thread, constitutes what is called the water-frame or throstle.'

- 8. Arkwright's invention was now generally adopted, but in order to deprive him of his patent-rights, and the just reward of his long and persistent exertions, several of the leading Lancashire manufacturers combined in an unprincipled attempt to blacken his reputation. Kay, who had long been dissatisfied with his share of the profits, sold them what little knowledge he possessed, and, acting upon the statements, whose truth he alleged, they accused Arkwright of having stolen the idea of the water-frame from a poor reed-maker, named Highe or Hayes, who had previously employed Kay in the construction of a model of his invention. They brought all their wealth and influence to overwhelm him in the courts of law. They excited the passions of the artisans against him; and this is always an easy task, for the ignorant regard every improved mechanical aid as an invasion of the rights of labour. So they rose, and pulled to pieces a mill which he had erected at Chorley, in the very presence of a strong body of the military and the The mob, however, was eventually subdued; the manufacturers continued their hostility, and, in order to defend his patent-rights, Arkwright was compelled to bring no less than nine actions at law against the principal offenders.
- 9. In the first, against Colonel Mordaunt, tried in the Court of King's Bench, in July 1781, Arkwright was defeated, on the ground of want of intelligibility and fulness in the specification on which his patent had been obtained. On this result he abandoned the other eight actions, and contented himself with publishing a pamphlet, containing his statement of his 'case,' and offering reasons why the legislature should interfere for his protection.

10. He remained inactive, as far as his patent was concerned, for another four years, but in February 1785, made a second attempt to maintain his rights, in the Court of Common Pleas. On this occasion several engineers gave evidence in his favour, declaring that from the specification he had furnished they could readily construct a spinningmachine, and accordingly the verdict of the jury reinstated him in his monopoly. But his opponents now took higher ground, and in the month of June, in the same year, a scire facias, which is nominally an action at the suit of the Crown, was brought against him, to repeal the patent -Highe, Kay, and Kay's wife being called to prove that the water-frame was invented by Highe in the early part of 1767, during his residence at Leigh; that he had employed his friend and neighbour, Kay, to construct a model of the invention; and that Kay, upon meeting with Arkwright, a short time after, at Warrington, had been induced to communicate to him the secret, on condition that the two should equally share in any profits they might derive from its application.

11. 'This famous trial,' says Mr. Craik, 'lasted from nine o'clock in the morning till half-past twelve at night, and excited the greatest interest, both among those more immediately concerned, and among the public generally. Among the witnesses examined were Mr. Cumming, the well-known watchmaker, Mr. Harrison, the son of the inventor of the marine chronometer, Mr. Darwin, and the since celebrated James Watt. The result was a verdict again invalidating the patent, which, on a motion being made for a new trial, the Court refused to disturb. Arkwright, after this, never took any further steps to vindicate his patent rights. This has led some writers to argue, that in all probability he had really obtained the inventions in the manner that Highe and Kay alleged. It is, however, to be remembered, that it has been a common fate with those who have been fortunate enough to enrich themselves by their happy inventions, to have attempts made to take from them the honour of those discoveries, of the profits of which it is found impossible to deprive them; and that it has seldom, in such cases, been difficult to find some hitherto unheard-of genius to set up his claim to the prior discovery of what, nevertheless, it would appear he scarcely knew the value of, In this particular case, the after he had discovered it. other party had a strong interest in setting aside Arkwright's pretensions if they could, and the circumstance of Kay having been connected with Highe before he was employed by him, afforded them a tempting foundation on which to erect what they, no doubt, considered a very convenient theory. Then, again, as for so much of their allegation as rested upon the evidence of this Kay, it was not entitled to command much attention, since it appeared both that he had some time before quarrelled with Arkwright, and that he must, even by his own account, have acted so perfidious a part in regard to his first friend, Highe, as to deprive him of all claim to be believed in anything he might now choose to assert. Highe's own evidence is undoubtedly what seems to bear strongest against Arkwright; but he, from very natural causes, might have been mistaken as to various points. He appears to have told his story in a very confused and ineffective way; much as if either he did not feel his ground to be very sure, or was not at all aware of the importance of the facts to which he was brought to speak. It is not impossible that, if he did actually invent the machine in question, Arkwright may have also hit upon the same idea about the same time; or may, at least, have been led to it merely by some vague rumour that had got abroad as to what Highe was about not an unnatural supposition, when we reflect that his operations seem to have been a good deal talked of in the neighbourhood, and that the slightest hint of the principle of the water-frame would have sufficed to put an ingenious man like Arkwright in possession of the whole machine. And this, after all, gives us, perhaps, the most natural explanation of his conversation with Highe at Manchester. If he knew that he had really stolen his invention from that person in the manner stated in Kay's evidence, it is not likely that he would have been much disposed to meet him at all; whereas the interview appears to have been arranged

by the intervention of a mutual acquaintance, who no doubt had obtained the consent of both parties to his

bringing them together.'

12. At all events, it is incontestable, that whether Arkwright did, or did not, borrow from Highe the rude outline of the water-frame, to him belongs the merit, 'both of having combined its different parts with admirable ingenuity and judgment, and of having, by his unwearied and invincible perseverance, first brought it into actual use on anything like an extensive scale, and demonstrated its power and value.' What Stephenson said of the locomotive, that it was due, 'not to one man, but to the efforts of a nation of mechanical engineers,' is true also of Arkwright's machine. And such is the case with most mechanical inventions they are suggested by the demands of Labour. The same idea arises spontaneously in many different minds; but the 'capacity to conceive' and the 'capacity to execute' are not always coexistent in the same mind, and the palm of victory is therefore due to him who elaborates the idea. adapts it to practical purposes, and presents it to the world in a working and workable shape. 'Many ingenious minds,' say Mr. Smiles, justly, 'labour in the throes of invention, until at length the master mind, the strong practical man, steps forward and straightway delivers them of their idea, applies the principle successfully, and the thing is done.' Hargreaves, Highe, and Kay were of service to the world as far as their métier went, but without Arkwright the Lancashire cotton manufacturers must have waited long for the perfected spinning-machine. He may not have had genius, but he had perseverance, which is the next best thing to it, and is often far more successful, as far as relates to the actual concerns of life and humanity.

13. Arkwright's loss of his monopoly had little effect upon him. He possessed an abundance of the true English quality, of never knowing when he was beaten. He built, with successive improvements, mills in Lancashire, Derbyshire, and New Lanark. When his partnership with Reed and Strutt expired, the Cromford mills also fell into his hands, and such was the extent of his resources—such the

superior quality of his wares—that he soon obtained a control over the whole trade, fixed its prices, and gave law to the lesser cotton-spinners. He was an indomitable worker. Nothing daunted, nothing wearied him. The superintendence of his numerous factories entailed such heavy labour, that his hours were closely engaged from four in the morning until nine at night; but both bodily and mentally he was so constituted as to bear it without the slightest injury. Such was the value he set upon time, that, whenever he travelled, his chariot was drawn by four horses. And, as an instance of his energy and resolution, we may mention that he was fifty years old when he began to study English grammar and practise penmanship and orthography.

14. Arkwright died, a very wealthy man, in 1792. He had been knighted in 1786; not, let us hasten to explain, because he had opened up, in the cotton manufacture, a source of national wealth of inconceivable importance, but because, as High Sheriff of Derby, he presented George III. with an address from the county, congratulating him on having escaped the murderous hands of Margaret Nicholson.

THE ENGINEERS.

1. England is emphatically the land of inventions and inventors—the very royalty and kingdom of the engineers. Her limited extent has necessarily compelled her sons to multiply their resources by the adoption of many-handed machinery; and the strength and energy of the Saxon character have inspired them to grapple with Nature herself —to bridge the swelling river, to check the inroads of the usurping sea, to throw firm highways across the marshes, and open a path for the swift spirit of Steam through the heart of the everlasting hills. 'Englishmen,' as Emerson says, 'love the lever, the screw, and the pulley; the Flanders draught-horse, the waterfall, windmills, tidemills; the sea and the wind to bear their freight-ships. More than the diamond koh-i noor, which glitters among their crown jewels, they prize the dull pebble, which is wiser than a man, and whose poles turn themselves to the

poles of the world, and whose axis is parallel to the axis of the world. Now, their toys are steam and galvanism. They are heavy at the fine arts, but adroit at the coarse; not good in jewellery or mosaics, but the best iron-masters, colliers, wool-combers, and tanners in Europe.'

Yes; England is the kingdom of the engineers. The steam-engine, the locomotive, the power-loom, the divingbell, the safety-lamp, the forcing-pump, the suspension bridge, the Thames tunnel—these have all been the achievements of Englishmen, and are significant of the species of work in which they most delight. And, for our part, we believe that a nation has more reason to be proud of the steam-engine than of the Venus di Medicis; has more reason to be proud of a Watt, a Stephenson, a Rennie, and a Brindley, than of Apelles, the painter, or Phidias, the sculptor.

- 2. The career of a successful engineer can hardly fail to be pregnant with lessons which the youthful student will do well to ponder. To attain eminence in so arduous a profession, he who adopts it must combine energy with patience, fertility of invention with calmness of judgement, quickness of conception with sobriety of discrimination. He must be unflinching in perseverance, ceaseless in action, resolute in difficulties, and zealous in his devotion of his thoughts and faculties to one absorbing purpose. student who flutters from science to science, who quails before the earliest obstacles, sickens at the first discouragement, who dallies in the flower-gardens of romance or poetry, who grasps at no fixed object, and is animated by no strong, unresting and unquenchable desire, will never take rank with the masters of earth and sea—the lords of humankind—whose genius has literally tamed the elements, and annihilated time and space!
- 3. In our notice of George Stephenson we have already pointed out the success which crowned his earnest pursuit of his one great idea—the railway locomotive. We have shown how Watt, in like manner, worked out the steamengine. We have shown how Arkwright mastered the spinning machine. In our sketches of the careers of

Smeaton, Telford, and Rennie, the same truth will be illustrated with equal vividness, and our young readers will see that success in life is only to be won by the vigorous prosecution of—a Steady Aim.

JOHN SMEATON.

1. Among our examples of men whose success in life has been attained by the entire devotion of their faculties to the profession they have adopted, we cannot refuse to include the architect of the Eddystone Lighthouse.

John Smeaton was born at Austhorpe Lodge, near Leeds, on June 8, 1724, his father being a respectable solicitor of that town. He received the rudiments of education from his mother, displaying at an unusually early age an affection for mechanical pursuits. A chisel or a good clasp knife was to him a possession of priceless value. He regarded toys with supreme contempt, caring only for the utilities—something that would 'work' a windmill, a pump, or some similar miniature fabric. Having one day observed some millwrights at work, he was shortly afterwards discovered affixing what he intended for a windmill to the top of his father's barn. At another time he procured from the plumbers a piece of bored pipe, out of which he constructed a pump that positively raised water. But prophets are seldom honoured in their own country, and the lad thus dimly groping at an imperfect application of the principles of mechanical science, was called by his comrades, 'Fooley Smeaton.' Like most boys of real talent, he was constitutionally shy, only breaking through the outward crust of his reserve where information could be gained in answer to his pertinent questions.

2. At a proper age he was sent as a pupil to the grammar-school, at Leeds, where he advanced rapidly in geometry and arithmetic; but, as much of his time was spent at home, he still continued to amuse his leisure hours among his beloved models. His ingenuity, how
rat, occasionally led him into difficulties. Having closely

observed the erection of a pumping-engine at the Garforth coal-mines, he proceeded to fashion a working model at home, duly provided with pumps and other apparatus, and trying its powers upon one of the fish-ponds in front of his father's house, soon succeeded in pumping it completely dry, to the detriment of the fish and the annoyance of his father.

- 3. The elder Smeaton, however, made no serious effort to check the growth of his son's mechanical tastes, but provided him with an atélier in an outhouse, where he turned boxes out of wood and ivory, fused and forged metals, and generally acquitted himself creditably as smith, joiner, and carpenter. He made a lathe, by which he cut a perpetual screw in brass, the invention of a Mr. Henry Hindley, of York, a man of fertile talent and communicative disposition, between whom and the young Smeaton a cordial intimacy subsisted.
- 4. When he left school, his father wished to train him for his own profession, and partly to remove him from the mechanical pursuits to which he was so zealously devoted, and partly to place him within reach of the best legal education possible, he was sent, towards the close of the year 1742, to London, where he attended the courts in Westminster Hall. But his ardent love of a mechanical occupation drew him away from the grave presence of the austere Themis. Dearer to him the piston of a pump, or the fans of a windmill, than all the subtleties, and quips, and quiddities that ever meandered over acres of parchment! To this effect he wrote his father, and besought permission to adopt an avocation more suitable to his tastes and faculties than that of a legal practitioner. Though, in that day, the engineer was regarded as simply a common workman, the elder Smeaton did not refuse his consent, and continued to his practical son, throughout his career, the advice of an affectionate father, and the liberal patronage of an intelligent man.
- 5. The young Smeaton, on finding that his father would not oppose his wishes, placed himself under the instructions of a philosophical instrument maker. He applied himself.

so industriously to his new pursuit, that he was soon the master of a small but comfortable independence. 1750, he commenced business on his own account as a maker of mathematical instruments, lodging in Furnival's Inn Court, from whence are dated his earlier communications to the 'Transactions of the Royal Society.' In 1751, he engaged a boat on the Serpentine to test the merits of a machine he had invented for measuring a ship's rate of sailing at sea. In the following year his enquiries were addressed to the question of possible improvements in Otto Guericke's air-pump, and in 1753 he was occupied in a series of experiments, whose result was his elaborate 'Inquiry concerning the Natural Powers of Water and Wind to turn Mills and other Machines depending on a Circular Motion.' When we remember that these scientific studies were pursued in the few leisure hours of a laborious trade. we must allow that Smeaton's industry was scarcely less conspicuous than his talent. He also devoted several hours daily to the acquisition of the French language, to enable him to make a journey which he contemplated into the Netherlands, for the purpose of inspecting the great canal works of the Continental engineers. 'Indeed,' says his last and best biographer, 'Smeaton was throughout life an indefatigable student, but, above all things, on self-improvement. One of his maxims was, that "the abilities of the individual are as debt due to the common stock of public happiness," and the steadfastness with which he devoted himself to useful work, in which he at the same time found his own true happiness, shows that this maxim was no mere lip-utterance on his part, but formed the very mainspring of his life. From an early period he carefully laid out his time with a view to getting the most good out of it: so much for study, so much for practical experiments, so much for business, and so much for rest and relaxation.'

6. Smeaton set out for Holland in 1754, and travelled through that country and Belgium, partly on foot, and partly in the *treckshuyts*, or canal-boats, that he might tely examine the different engineering monuments ich those nations are famous. 'He found himself in

a country which had been, as it were, raked out of the very sea, for which nature had done so little, and skill and industry so much. From Rotterdam he went by Delft and the Hague to Amsterdam, and as far north as Helder, narrowly inspecting the vast dykes raised around the land to secure it against the hungry clutches of the sea, from which it was originally won. At Amsterdam he was astonished at the amount of harbour and dock accommodation. existing at a time when London as yet possessed no conveniences of the sort, though, indeed, it always had its magnificent Thames. Passing round the country by Utrecht, he proceeded to the great sea-sluices at Brill Helvoetsluys, by means of which the inland waters discharged themselves, while the sea waters were securely dammed out. He made careful memoranda during his journey, to which he was often accustomed to refer, and they proved of great practical value to him in the course of his subsequent extensive employment as a canal and harbour engineer.'

7. An opportunity now occurred (1755) to Smeaton of proving, in the face of the world, that original mechanical genius of which he undoubtedly felt himself possessed, and which he had cultivated by assiduous study and watchful travel. He seized the opportunity; and this it is that sums up the difference between the successful man and the unsuccessful — the power of detecting the opportunity, and of improving it to its greatest possible results. 'Opportunity,' says the French proverb, 'makes the thief.' Opportunity, at all events, makes the hero. What is military tactic—the art of a Napoleon or a Wellington—but the ability of grasping the fitting opportunity, and overwhelming the enemy at some unguarded point? What is diplomacy but the skilful use of opportunities? Therefore would we caution our youthful readers never to suffer an opportunity to glide by unheeded. 'Opportunity,' as the old Latin adage hath it, 'has hair in front, but she is bald behind. You may hold her if you seize her by the forelock, but once permitted to escape, she may not be caught again, even by Jove himself.'

- 8. A line of gneiss rocks, twelve miles distant from the coast of Devon, and lying between the two noted headlands of the Start and the Lizard, stretches six hundred feet across the Channel, and, collecting the stormy waters of the Atlantic around it, creates there a whirl and a restless motion which have suggested to seamen the significant name of the Eddy stone. From its position right in the track of ships entering the channel from the west and south, this reef, for centuries, was a source of constant and deplorable disasters. Woe to the barque that was dashed upon it! Woe to the seamen who were engulphed in its boisterous breakers! Dead bodies and shattered timbers were all that reached the neighbouring mainland to tell of the catastrophe that had occurred!
- 9. It was not until the close of the last century, or rather the beginning of the present, that Government undertook—what was, nevertheless, its peculiar duty—the erection and maintenance of fixed and floating lights for the guidance of the sailor on dangerous parts of the British coast. All that was done in this way was done by private enterprise, and it is no marvel, therefore, that many a winter of storm and wreck passed by, before any adventurer could be found to undertake the construction of a lighthouse on the perilous Eddystone. It was not until 1696 that such a man was found—in the person of a Mr. Henry Winstanley, mercer and gentleman, of Littlebury, in the county of Essex. He was possessed of no ordinary mechanical ingenuity, though of a somewhat quaint and fantastic turn, and delighted in surprising his guests at Littlebury by the most extravagant practical jokes. Thus, upon entering a room, you noticed a slipper, lying purposedly in your way: you kicked it, and straightway a ghost started up from the floor; or, sitting down on a particular seat in the garden-. arbour, you found yourself, almost immediately, floating in the middle of the adjacent canal. This was the mechanician who, upon receiving the usual privilege—a permission to levy tolls upon passing ships—ventured to build the first Eddystone Lighthouse.
 - 10. It was of as whimsical a character as its adventurous

architect. It occupied four years in building, from 1696 to 1700; was built of wood; soared 100 feet in height; rejoiced in numerous fantastic projections, and was encircled at the summit by an open gallery, through which a high sea might have carried a six-oared boat! Winstanley was so satisfied of its stability, that he did not hesitate to express his hope he might be within it in the most terrific storm that ever blew. His wish was granted: while superintending some repairs, on the night of November 26, 1703, a fearful gale arose, and the next morning there remained no other vestiges of the lighthouse than a few rugged stones and a fragment of iron chain! To this catastrophe the poet Gay refers:—

Fam'd Eddystone's far-shooting ray, That led the sailor through the stormy way, Was from its rocky roots by billows torn, And the huge turret in the whirlwind borne.

11. Mr. John Rudyerd, a silk-mercer, of Ludgate Hill, was the next who attempted to build a lighthouse on the Eddystone. The son of a Cornish labourer, he was a man of much force of character and power of mind, who had raised himself to a position of credit and respectability by his zealous pursuit of an object in life. His idea of a new structure was as bold as it was original, and had he embodied it in stone instead of wood, he might have anticipated Smeaton. Choosing the frustrum of a cone for his model, he built up five heavy courses of stone upon the rock, and thereupon erected a wooden superstructure, simple, unornamented, and offering as little resistance to the wind and the waves as was possible. The lantern was lit by candles, 70 feet above the highest side of the foundation, which was of a sloping form. From its lowest side to the summit of the ball which crowned the structure, was 92 feet,—the timber cone resting on a base of 23 feet 4 inches. It was finished in 1709, and for years admirably answered its beneficent purpose; but about two o'clock, on the morning of December 2, 1755, some Cawsand Bay fishermen, and the look-outs on board Admiral Westrode's fleet, then lying in the Sound, gave the alarm that the Eddystone lighthouse was on fire! Like a pillar of light, a cone of coruscating flame, it burned for day and night, until, by December 7, only a few clumps of blackened iron remained to tell what it had been.—Rudyerd's lighthouse was destroyed!

12. The increasing commerce of the kingdom, however, rendered a lighthouse at this dangerous point a matter of necessity, and the proprietors, who held a lease of it from the Trinity Brethren, determined upon its immediate reconstruction. For this purpose they applied to Smeaton, who had already gained a widespread reputation for resolution, intelligence, and mechanical ability. He set about his task with a due conception of its difficulties and responsibility. 'In contemplating,' he says, 'the use and benefit of such a structure as this, my ideas of what its duration and continued existence ought to be, were not confined within the boundary of one Age or two, but extended themselves to look towards a possible Perpetuity.'

After several visits to the rock, Smeaton determined that the new lighthouse must be of stone, and he proposed to dovetail each piece together so tenaciously, that its durability, and capacity of effectually resisting the violence of the winds and waves, should be incontrovertible. The first stone was laid on August 3, 1756; but little could be effected during the following autumn and winter, and it was not until the summer of 1757 that the work was fairly begun. The construction of the whole was indefatigably superintended by Smeaton himself, who was always foremost when any danger was to be confronted, or any unexpected obstacle dealt with. Thus it happened that, without serious mishap or disaster, the new structure was completed, and the light first exhibited on the night of October 16, 1759.

13. From that date to the present the Eddystone light-house has successfully braved the fury of the storm-test waters; a pillar of safety, and hope, and consolation to the homeward-bound barque as she ploughs the rough tides of the channel. The billows will sometimes fling themselves over its very summit, and sometimes hurtle against it with



SMEATON AT THE EDDYSTONE.

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a roar of thunder and a crash like that of a wind-torn pineforest; but still, exultant and defiant, its lamp flings forth a blessed radiance of love and mercy—

With strange unearthly splendour in its glare.

14. The Eddystone lighthouse was, perhaps, the most memorable—as it is undoubtedly the best known—of Mr. Smeaton's engineering achievements, but many of his other works were of a character to call forth all the resources of his genius. At Perth, Coldstream, and Banff, he erected bridges; he was largely employed in the drainage of the Lincolnshire fens; and he designed and constructed the Forth and Clyde Canal, to unite the seas which respectively wash the eastern and western coasts of Scotland. Of the latter important work a few details may be given in illustration of the difficulties which Smeaton's genius conquered: it is about 38 miles in length, and includes 39 locks, with a rise of 156 feet from the sea to the summit level. Rocks and quicksands lie in its course, and sometimes the canal has to cross deep rivers, in others to run along embankments more than 20 feet in height. It traverses many roads and rivulets, and two rivers, the Luggie and the Kelvin — the bridge over the latter being 275 feet long, and 68 feet high. Its depth is 8 feet, and vessels of 19 feet beam and 68 feet keel are capable of easily passing along the navigation between the east and west coasts.

15. Smeaton was also employed by Dr. Roebuck upon the celebrated Carron Iron Works, projected by that ingenious but unfortunate speculator. There the employment of coal in iron-smelting was first practised on a large scale, and Smeaton was engaged to erect a very powerful blowing apparatus for this purpose, which he effected in 1768, using a water-wheel as the motive power. He also furnished a design for a double-boring mill for drilling cylinders and guns—the well-known species of ordnance called 'carronades' having been introduced by the Carron Company.

16. The construction and improvement of 'harbours' was also included in Smeaton's engineering practice, and

his name is associated with those of Bristol, Christchurch, Dover, Lynn, Rye, Scarborough, Sunderland, Whitehaven, Workington, and Yarmouth. But the most important works of this nature which he actually carried out, were those of Ramsgate. In building the pier there he first employed the diving-bell for laying the foundations. In every branch of his profession Smeaton's advice was sought and his authority respected, and there was scarcely an undertaking of any eminence, of an engineering character, in which—to the very close of his life—he was not engaged.

17. Smeaton, during this busy and successful career, still continued to reside at the place of his birth, Austhorpe, near Leeds. Here he had erected a square tower, four stories high, at some slight distance from his dwellinghouse — occupying the four stories respectively as his forge, his turning-room, his cabinet of models, and his attic or observatory. To the last he was a mechanic—a mechanic from love and affection; contriving and constructing for the simple pleasure of the work. 'His pursuits in his workshop and at his desk were varied by visits to his blacksmith's shop. One of his principal objects, on such occasions, was to experiment upon a boiler—the lower part copper, and the upper part lead—which he had fitted up in an adjoining building, for the purpose of ascertaining the evaporative power of different kinds of fuel, and other points connected with the then little understood question of steam power. He was on very familiar terms with the smith, and, if he thought he was not very handy about a piece of work he was engaged upon, he would take the tools himself and point out how it should be done. One of the maxims which he frequently quoted to his smith was, "Never let a file come where a hammer can go."

18. Smeaton died on October 28, 1792, in the 68th year of his age, and was buried in the parish church of Whitkirk, where a modest tablet, erected by his daughters, not unjustly describes him as 'a man whom God had endowed with the most extraordinary abilities, which he indefatigably exerted for the benefit of mankind in works of science and philosophical research.' As long

as the Eddystone lighthouse stands he will need no better monument of his genius, no more glorious memorial of his fame!

THOMAS TELFORD.

1. If any of our young readers desire ampler evidence than our preceding examples have afforded of the success, either moral or material, which invariably rewards our prosecution of a Steady Aim, let him study the life of Thomas Telford.

Eskdale, or the valley of the Esk, was, a century ago, one of the obscurest and least populous portions of the county of Dumfries, as it was then, and still is, one of the most picturesque. Here, in the shadow of the green heathery hills, and on the bank of a small but noisy burn or rivulet, was born Thomas Telford, August 9, 1757. His father was a herd on the sheep-farm of Glendinning, and the house of his birth and early years, a rude rough cottage, of four mud walls, spanned by a roof of thatch, which crested a solitary knoll, and looked out upon the mossy vesture of the hills, and the grey cairns that started up from their sloping sides, gloomy and abrupt, like mute memorials of a vanished generation.

2. Telford was but three months old when he lost his father, but in his mother—a true-hearted, brave-minded woman—he found a stay, support, and solace. The dalesmen, with that sympathy for the poor which the poor so vividly feel, stretched out to the widow and the orphan a helping hand, entertaining the child in their own homes in regular rotation, while the mother did abroad what work she could. With young Telford the simple village life of Eskdale wrought wonders: he grew up strong and healthy, displaying a remarkable amount of native humour, and acquiring an intimate acquaintance with Nature and Nature's curiosities. In due time he went to the parish school at Westerkirk, his summer earnings helping to pay the winter fee, and there his strong native sense and shrewd judgment soon mastered the rudiments of an English education. He learnt to read, write, and cypher, and thus seized upon the best weapons with which a brave

man may successfully fight the great battle of Life. 3. His next step in advance was his apprenticeship to a stonemason, who treated him with so much harshness that, after a brief endurance, high-mettled 'Tom' ran away from him, and returned to his widowed mother. A mason at Langholm was then found willing to take him into his service for the remainder of his apprenticeship, and this new master, Andrew Thomson, being much employed by Henry, Duke of Buccleuch, young Telford gained an insight into several of the more important branches of the building trade. While thus employed, his industry and good humour procured him the patronage of the Lady of Langholm, a Miss Pasley, who invited him to her house, and threw open to him her little library. Oh! the delight with which the eager lad betook himself to the perusal of the masterpieces of English literature! His scanty leisure was wholly devoted to reading, and during its happy hours he lived in that Enchanted Land whose golden gates are never flung open but to the magic 'sesame' of the ardent and enthusiastic student. He read Shakspeare and Milton, and devoured Burns, whose passionate lyrics actually warmed the studious mason's apprentice into verse! In a poetical 'Epistle,' which about this time he addressed to the great Scotch bard, he thus sketches himself:-

Nor pass the tentie curious lad,
Who o'er the ingle hangs his head,
And begs of neighbours books to read;
For hence arise
Thy country's sons, who far are spread,
Baith bold and wise.

4. Telford soon acquired the reputation of a 'prodigious scholar' in Langholm, and was much employed as a scribe by his less educated neighbours. His apprenticeship was now ended, and he was carning the monstrous wage of eighteenpence a day! What was more to the purpose, however, he was daily acquiring skill in his handicraft, and committing to memory the lessons of experience.

Thus, mind-work and hand-work went on together. It was while employed in building a parsonage-house at Westerkirk, the most important task with which he had yet been entrusted, he wrote his graceful descriptive poem of 'Eskdale,' whose general character will be understood from the following brief specimen:—

There, round his little fields, the peasant strays, And sees his flock along the mountain graze; And, while the gale breathes o'er the ripening grain, And soft repeats his upland shepherd's strain; And western suns with mellow radiance play, And gild his straw-roofed cottage with their ray, Feels Nature's love his throbbing heart employ, Nor envies towns their artificial joy.

- 5. In 1780, 'our hero' became desirous of 'fresh fields and pastures new,' and removed to Edinburgh, where the New Town was then in course of erection. For two years he obtained constant employment, and that, moreover, in first-rate work; while his spare hours he occupied in sedulously practising architectural drawing. He had an object before him. A laudable ambition inspired his soul, and therefore it was that he concentrated all his faculties upon the pursuit he had adopted. 'Aut Cæsar, aut nullus,' is the true maxim of an honourable and aspiring mind, and in pursuance of it Telford, in 1782, made his way towards that mighty metropolis which gathers into its impartial embrace so much of the goodness and greatness, as well as of the vice and folly, of the world.
- 6. Having bidden adieu to his home and the friends of his youth, and received the farewell ejaculation—'Ah, he's an auld-farrant chap is Tam; he'll either mak a spoon or spoil a horn; onyhow, he's gotten a guid trade at his fingers' ends'—Telford set out for London, riding a horse which one Sir James Johnstone wished to send thither for a member of his family, and armed with a letter of recommendation to Mr. John Pasley, then a London merchant of 'credit and renown.' This letter procured him an introduction to Sir William Chambers, the architect of Somerset House, who employed him among the hewers at work were

that stately pile. Whatever Telford did, he made a point of doing as well as he could, and it was not long, therefore, before he won, even among metropolitan workmen, a high character for superior ability; and having met with an admirable stone-carver, of industry and intelligence, named Hatton, he proposed to him that they should start on their own account as master-builders. But though Robert Adam, the architect, promised his support, money—the sinews of business as well as of war—was found wanting, and the promising scheme had to be abandoned.

7. But Telford was determined to rise out of the ranks, to elevate himself above the mass of ordinary artisans. Success soon smiled upon his resolute perseverance. We find him, in 1784, superintending the erection of a house (designed by Wyatt) for the Commissioner of Portsmouth Dockyard, a new chapel, and other buildings of importance; so that the son of the Eskdale herdsman was already rapidly mounting the steps of the ladder, and with steady gaze could see the summit above him, at no immeasurable distance. His mode of life at this time is thus described by himself:—

'I rise in the morning at seven (February 1st), and will get up earlier as the days lengthen, until it come to five o'clock. I immediately set to work to make out accounts, write on matters of business, or draw, until breakfast, which is at nine. Then I go into the yard about ten, see that all are at their posts, and am ready to advise about any matters that may require attention. This, and going round the several works, occupies until about dinner-time, which is at two; and after that I again go round and attend to what may be wanted. I draw till five; then tea; and after that I write, draw, or read until half after nine; then comes supper and bed. This is my ordinary round, unless when I dine or spend an evening with a friend; but I do not make many friends, being very particular, nay, nice to a degree. My business requires a great deal of writing and drawing, and this work I always take care to keep under by reserving my time for it, and being in advance of my work rather than behind it. Then, as knowledge is my

most ardent pursuit, a thousand things occur which call for investigation which would pass unnoticed by those who are content to trudge only in the beaten path. Here I am now very deep in chemistry. The mode of making mortar in the best way led me to inquire into the nature of lime. Having, in pursuit of this inquiry, looked into some books on chemistry, I perceived the field was boundless; but that to assign satisfactory reasons for many mechanical processes required a general knowledge of that science. . I am determined to study the subject with unwearied attention until I attain some accurate knowledge of chemistry, which is of no less use in the practice of the arts than it is in that of medicine.'

To a man animated with a love of knowledge so profound, an industry so methodical, and a perseverance so resolute, nothing was impossible. It is for such men that the prizes of labour are reserved.

8. We must pass over some years of arduous study and constant toil to arrive at the period of Telford's first employment as an engineer. The first bridge designed by him, and built under his superintendence, was that of Montford, across the river Severn. It was finished in 1792. In the same year he built the simple and semi-classical parish church of St. Mary Magdalen at Bridgenorth. But the true inauguration of the career which made him famous, and fully developed his splendid abilities, was his appointment as engineer to the Ellesmere Canal Company in 1793. This great undertaking was projected for the purpose of affording a water communication between the Mersey, the Severn, and the Dee, and its whole extent (including the Chester Canal) was not less than 112 miles. Operations were commenced in 1793, and continued for several years, which embraced works of the utmost magnitude and difficulty. Among these may be named the Chirk aqueduct traversing the valley of the Ceriog, on ten arches of 40 feet span each, at a height of 70 feet above the level of the stream, and the Pont Cysylltau aqueduct, characterised by Sir Walter Scott as 'the most impressive work of art he had ever seen, which crosses the Dee, in the picturesque valley of Llangollen, at a height of 127 feet above the river. Its nineteen arches cover a span of 1,007 feet.

- 9. Telford's fame is also inseparably associated with his Iron Bridges. Works of this character had already been constructed at Coalbrookdale in 1777, and over the river Wear, at Sunderland, in 1796. The third in England was built by Telford in the same year, at Buildwas on the Severn, about midway between Shrewsbury and Bridgenorth. It consists of a single arch of 130 feet span, but is so light in design, and so admirably constructed, that it contains only 173 tons of iron. He also applied this famous English metal in the construction of road bridges, of which he built no less than forty-two in the county of Shrewsbury. Five of these were of iron.
- 10. He was next engaged by Government to open up the hitherto almost inaccessible region of the Scottish Highlands by a comprehensive system of good roads and bridges, and displayed in this important task a surprising fertility of resources and an amazing wealth of expedients. It was natural, therefore, that he should also be selected to improve the harbour accommodation on the Scottish coast, and he designed and superintended the formation of the tide-basin at Wick, the harbour at Peterhead, and the havens of Banff, Nairn, Kirkwall, and other fishing towns or seaports. But the most extensive were those of Aberdeen and Dundee, which alone would have established his reputation as a bold and successful engineer.
- 11. Meanwhile, he was actively superintending the works of the Caledonian Canal, a great water communication between the north-east and north-west coasts of Scotland, which was commenced in 1804. From the nature of the country which it traversed, the difficulties presented were of a stupendous character. Each lock was from 170 to 180 feet in length, 40 broad, and 20 deep. The harbour or basin, at the north-eastern extremity, covered an area of 32 acres. The mountain torrents roaring and rushing underthe canal, required sluices, culverts, tunnels, and underbridges to carry off their accumulating waters. Eight iron bridges provided for the public roads which crossed the

line of the undertaking. The works, therefore, were not wholly complete until 1822, and they involved a total outlay of about 1,000,000*l*. sterling; but notable as the canal must be considered as an engineering achievement, it has never been successful as a commercial speculation.

To enumerate all the works which Telford, in the course of his busy career, designed or improved, repaired or enlarged, in the United Kingdom, would be foreign to our purpose. He was also employed abroad, and the Gorha Canal, connecting Lake Wenern and the Baltic, was constructed from his surveys. The extent of the whole navigation is 120 miles, and each of its locks measures 120 feet

in length by 26 feet in breadth.

12. Telford was so great a bridge-builder that Southey aptly entitled him our 'Pontifex Maximus,' but he was not less famous or successful as a 'Colossus of roads,' and most of the broad and noble highways which radiate from London to the great provincial towns, and which were wont to see the and roar with the ceaseless procession of the commerce and trade of the empire, until superseded by the stout iron way and the swift locomotive, were reconstructed, or entirely laid out, by our Eskdale engineer. From Carlisle to Glasgow; from Morpeth to Edinburgh; from London to Morpeth; from London to Liverpool; from Liverpool to Holyhead, he opened up new lines of communication, accelerating the conveyance of goods, mails, or passengers, by their excellent levels, their easy gradients, and admirable stability and smoothness of construction. The formation of the highway between London and Holyhead, on the route to Dublin, naturally led to the erection of a bridge across the Menai Strait, as calculated to materially facilitate communication between the metropolis and the capital of the sister kingdom. The Menai Bridge is a wonderful triumph of invention, and remains the great memorial of Telford's engineering genius, as the steam-engine is of Watt's, and the Eddystone Lighthouse of Smeaton's. Exegi monumentum aere perennius: no trophied bust, no pillar of marble or granite, can equal in sublimity the monument which a man consecrates to his own memory in the perfect accomplishment of a work of national importance, and of lasting benefit to the human race.

- 13. The iron bridge across the Menai, commenced in August 1819, and opened for public traffic in January 1826, consists of stout iron chains supporting a broad, firm roadway, which are stretched from pier to pier, a curvature of 579 feet, at such a height above the sea-level that full-canvassed ships may sail beneath, without lowering even their topgallant masts. The entire length of the bridge, as it hangs from shore to shore, is 1710 feet. The total weight of iron made use of was 2187 tons, and the cost, including embankments and approaches, did not exceed 120.000%.
- 14. The Conway Suspension Bridge (327 feet between the centres of the supporting towers); the St. Katharine Docks (A.D. 1825-1828), with available water-space of ten acres; the bridges at Tewkesbury, Gloucester, Edinburgh, and Glasgow; and the drainage system of the North Level, near Wisbeach; were the last achievements of our Eskdale hero. He was now declining in years, and increasing infirmities warned him to prepare for his final rest. He therefore retired from the active exercise of his profession, but, incapable of idleness, set to work upon the preparation of his engineering papers for publication. This life-long attachment to literature, and his occasional cultivation of no mean powers as a versifier, provided him with other sources of recreation during the months of shadow and rapidly-gathering clouds that yet remained to him. Aged in body, he was, however, still young at heart; the generous, faithful friend—the enthusiastic lover of nature—the man of infinite humour, that the world so long had proved him.
- 15. A life of success and honour was fitly closed by a death of tranquil happiness, September 2, 1834, at the advanced age of 77. He lies interred in the nave of Westminster Abbey, and the admirer of moral excellence and intellectual power should surely make a pilgrimage thither—where, side by side, two simple stones mark the last resting-places of 'Thomas Telford, 1834,' and 'ROBERT

Stephenson, 1859.' The son of the Eskdale herdsman and the son of the Killingworth brakesman thus repose, in silent companionship, with kings, and queens, and princes, and mighty warriors, whose careers are all summed up in those momentous words: 'Hic Jacet!'

16. Mr. Smiles, in drawing Telford's character, shows him to have been a man whom our young readers may well propose to themselves as a glorious model. 'Every step in his upward career,' he says, 'from the poor peasant's hut in Eskdale to Westminster Abbey, was nobly and valorously won. The man was diligent and conscientious; whether as a working mason hewing stone blocks at Somerset House, as a foreman of builders at Portsmouth, as a road surveyor at Shrewsbury, or as an engineer of bridges, canals, docks, and harbours. The success which followed his efforts was thoroughly well deserved. He was laborious, painstaking, and skilful; but, what was better, he was honest and upright. He was a most reliable man; and hence he came to be extensively trusted. Whatever he undertook, he endeavoured to excel in. He would be a first-rate hewer, and he became so. He was himself accustomed to attribute much of his success to the thorough way in which he had mastered the humble beginnings of this trade. He was even of opinion that the course of manual training he had undergone, and the drudgery, as some would call it, of daily labour—first as an apprentice, and afterwards as a journeyman mason - had been of greater service to him than if he had passed through the curriculum of a University.'

JOHN RENNIE.

1. Our 'Examples' borrowed from the ranks of men who have won success as inventors or discoverers, as skilful mechanicians or great engineers, may fitly conclude with the architect of the three principal London bridges, and the engineer of Plymouth Breakwater and the East and West India Docks. John Rennie was born at his father's farm of Phantassie, in East Lothian, on the 7th of June, 1761.

When only five years of age, he lost his father, but his mother was a noble substitute, and brought up her nine children with admirable care and discretion. John, the youngest, displayed his mechanical bias at a very early age, and, like Telford, was never so happy as when handling his hammer, chisel, or saw. He delighted in frequenting the smiths' and carpenters' shops in the neighbouring village, watching the men make use of their tools, and trying them himself when he got a chance. But no shop was equal to the shop of Andrew Meikle, the millwright (and ingenious inventor of the 'threshing machine'), which, as he went daily to the parish school, he passed both going and returning, and which, moreover, offered such strong temptations to the embryo engineer, that he frequently fell a victim to them, and played the truant without due consideration of the consequences!

- 2. Old Meikle was as fond of Rennie as Rennie was of his workshop, and superintended his construction of miniature wind-mills and water-mills ad libitum, and his launch of a complete flotilla of mimic ships for the navigation of the neighbouring river. The latter feat was accomplished when he was about ten years old. Meikle, who was himself a man of no ordinary ingenuity, also assisted him in fabricating models of a windmill, a steam engine, and Vellore's pile engine, all of them displaying (it is said) a considerable amount of manual dexterity. Thus the natural inclination of the boy was accidentally strengthened by a variety of circumstances, while, had they not existed, it might have gradually died out, or given place to some new influence.
- 3. At the age of twelve, Rennie was removed from the parish school of Prestonkirk to the Burgh or Free Grammar School of Dunbar, where, under the able tuition of Mr. Gibson, he made so rapid a progress in mathematical studies as to afford that dominie hopes that he was cherishing a second Newton. Two years of successful industry glided away, and Rennie, having mastered all that his instructor could teach, proposed to return to Meikle the millwright. Now, Mr. Gibson, at this very juncture, was promoted to

the rectorship of the High School of Perth, and the Dunbar magistrates gladly offered the vacant appointment to John Rennie. Flattering as such a proposal could not but be considered, Rennie's tastes and ambition were not limited to the tutorial profession, and, after he had discharged for six weeks the duties of the school, Mr. Gibson's successor

relieved him from the uncongenial post.

- 4. He returned with all speed to Phantassie, and plunged at once into the abstrusest questions of mathematics, mechanics, and natural philosophy, reducing his theory to practice under the supervision of Andrew Meikle; he soon acquired confidence enough in his powers to undertake mill-work on his own account, and, assisted by his brother George and his old friend Meikle, speedily succeeded in establishing a small connection. Before he was twenty years old, commissions flowed in upon him apace, and, as he executed all his work with scientific thoroughness, his efforts were rewarded with both fame and emolument. Thus, during the summer months, he earned enough to defray the expenses of a winter session at the University of Edinburgh; and there, under the able instruction of Robison and Black, he mastered the secrets of chemistry and natural philosophy, and in his spare hours conquered the difficulties of the French and German languages. His only recreation in the intervals of this severe study appears to have been the practice of the flute and violin.
- 5. Rennie attended the University for three successive The summer vacations (from May to October) he occupied in executing mill-work in various parts of the country. When his collegiate curriculum was completed (1783), he set out upon a tour in the manufacturing districts of England. At Birmingham he visited the illustrious Watt, with whom, to the close of his life, he maintained a cordial friendship. This visit led to his engagement, a few months later, to superintend the design and erection of the necessary mill-work and machinery of the Albion Corn Mills, then just projected, and which were to be driven by one of Boulton and Watt's steam engines. Rennie arrived in London towards the close of November 1784, and

immediately set to work. The opportunity was an excellent one for the young engineer, as the Albion Mills were the first in England worked by the agency of steam. He availed himself of it to the utmost, and from 1784 to 1788 was wholly occupied in devising ingenious arrangements of machinery, and simplifications of mechanism, with the object of utilising the steam-power to the utmost possible extent. His success was so complete that he won the praise both of Smeaton and Watt, and all the large corn mills afterwards erected in England were founded upon the system devised by the ingenious Rennie.* Thus his reputation was securely established, and on every side he was beset by proffered commissions of the highest importance.

6. 'Shortly after the completion of these mills,' says Mr. Smiles, 'Mr. Rennie was largely consulted on the subject of machinery of all kinds. The Corporations of London. Edinburgh, Glasgow, Perth, and other places, took his advice as to flour-mills. Agriculturists consulted him about threshing-mills, millers about grinding-mills, and manufacturers and distillers respecting the better arrangement of their works.' He supplied plans for a steel lead-rolling mill, for Messrs. Locke and Co., at Newcastle-on-Tyne; he was called in to rectify the defective boiler arrangements at Meux and Co.'s brewery; he advised the government upon the power for working their small-arms manufactory at Enfield, and the Navy Board respecting the apparatus for blowing the forge at Portsmouth. In 1792 he projected the depressing sluice for water-mills, which a Government engineer, a Mr. Lloyd, afterwards brought out (in 1807) as his own The Don Navigation Company's mills at Doncaster were entirely rebuilt after his designs; he sent plans of large flour-mills to one Don Diego at Lisbon, and of the extensive saw-mills erected at Archangel in Russia. July 1798, he was called upon to examine the machinery and arrangements at the Royal Mint on Tower Hill. The result was, the construction of a completely new mint, worked by steam-power, with improved rolling, cutting-out, and

^{*} The Albion Mills were destroyed by fire, March 3, 1791, to the lasting regret of their ingenious engineer.

stamping machinery, after Mr. Rennie's designs. The new machinery was introduced between the years 1806 and 1810. Although it has now been in use for half a century, it continues in as efficient a working state as in the year it was erected. It is still capable of turning out from the metal, in each day of twelve hours, two and a half tons of copper, and a ton each of gold and silver coin. The whole process, as carried out by this apparatus, is extremely beautiful and effective. The cutting-out and stamping machines were the invention of the late Matthew Boulton of Soho, but the machinery was by Mr. Rennie. Some idea of its efficiency may be gathered from the fact that 50,000l. worth of gold bullion can be coined into sovereigns in twelve hours. Sixty coins a minute are easily stamped by a single press, or between 3,500 and 5,000 an hour. On one occasion, in 1819, a million of sovereigns were turned out in eight days!

- 7. Rennie about this time formed an acquaintance with Earl Stanhope, a mechanical projector of no ordinary genius, to whom we are indebted for an excellent printing-press, for improvements in the construction of locks and canals, and for his intelligent efforts to adapt the power of the steam engine to the purposes of navigation. In the latter case he received both advice and assistance from John Rennie.
- 8. Our engineer was now, like Brindley, Smeaton, and Telford, to associate his name with canal-making, and he planned and accomplished some valuable works in this branch of his profession. The Kennet and Avon Canal is 57 miles long, with 48 locks, and an aqueduct, of great architectural beauty, crossing the Avon six miles below Bath. The Rochdale Canal runs 31½ miles, over a difficult mountainous country, and Rennie, in its construction, had to overcome the most formidable physical obstacles. The Lancaster Canal, from Wigan to Lancaster, crosses the Lune on a noble aqueduct of five semicircular arches, each 75 feet in span. The Croydon and Rotherhithe, the Thames and Medway, and river Lea navigation were also surveyed by this untiring and successful man.
- 9. We can but allude in passing to his drainage of the Lincoln and Cambridge Fens; an undertaking of the most comprehensive character and of great engineering sudacity.

which occupied some seven or eight years in its completion. Its success procured him the compliment that he was the greatest 'slayer of dragons' that ever lived; this title being given by the inhabitants of the Fen country to persons who, by skill and industry, have carried out works of drainage, and, by so doing, removed those causes of disease and premature death which were typified in the old time as

'dragons' or 'destroyers.'

10. In the early part of his career Rennie had built, or designed, several bridges in Scotland; notably that across the Tweed, at Kelso; and in England he had also executed several bridges of superior design and admirable workmanship. But his more splendid achievements of this character. and those with which his fame is indissolubly connected, are the three buildings which add so much to the commercial facilities of the metropolis, while they stand conspicuous as no unworthy ornaments of our noble river—Waterloo, Southwark, and London Bridges.

Waterloo Bridge was commenced in 1809, and opened by the Prince Regent, with an imposing state-ceremonial, on June 18, 1817. At the inauguration the Prince wished to confer the honour of knighthood upon its able architect, but he respectfully though firmly declined it. plain John Rennie he felt himself a greater man than he would become with the prefix of 'Sir' idly dangling before his name. He was content to be the 'Architect of Waterloo Bridge; ' of that splendid structure which Dupin, an observant Frenchman, pronounced 'a colossal monument, worthy of Sesostris or the Cæsars.'

Southwark Bridge, consisting of three cast-iron arches, with two stone piers and abutments, was commenced about

1815, and opened for public traffic in March 1819.

London Bridge was designed by Mr. Rennie in 1821, but its construction entirely superintended by his son, the present Sir John Rennie, for the works were not commenced until three years after their designer's death. It was finally thrown open to the public on August 1, 1831, when William IV. inaugurated it with splendid pomp. It is 1005

long, and 56 wide; and 'in severe simplicity and unsed elegance of design—in massive solidity, strength, and perfection of workmanship in all its parts, not less than as regards the capacious size of its arches, and the breadth and width of its roadway and approaches—is perhaps the finest work of its kind in the world.'

- 11. The Metropolitan Docks, those mighty evidences of our commercial greatness, sprang into existence through Mr. Rennie's enterprise. The London Docks, properly so called, he began in 1801, and completed in January 1805, but extensive as their area was considered, it proved insufficient for the myriad keels that now brought to the heart of England the wealth and resources of a world. The East India Docks. for the exclusive accommodation of the stately galleons of the East India Company, were next designed, and their construction entrusted to Rennie and Mr. Ralph Walker. Into these docks the illustrious engineer introduced many improved methods of working, for he was a notable economist of labour; and the machinery which he invented for the transport of huge blocks of mahogany by a combination of railways and locomotive cranes, effected, in the first six months, a saving in men's wages more than sufficient to defray their original cost.
- 12. We cannot notice in detail Mr. Rennie's numerous engineering successes. Almost every navigable river in England, every canal, every seaport from Southampton to Balbriggan, every harbour from Holyhead to Ramsgate, bears some mark of his original and adventurous intellect. He built the noble lighthouse on the Bell or Inchcape Rock. He devised the great Military Canal which crosses Romney Marsh from Hythe to the river Rother. He enlarged or reconstructed the naval dockyards at Pembroke, Portsmouth, Sheerness, Chatham, and Plymouth. And, finally, at the latter place, he erected the famous Breakwater, which may, perhaps, be not unjustly regarded as the most splendid engineering achievement of his time.
 - 13. The poet Drayton exclaims in the Poly-Albion-

Upon the British coast what ships yet ever came That not of Plymouth hears?—where those brave navies lie, From cannons' thund'ring throats that all the world defie.

And truly there is no seaport in England which has a higher interest for Englishmen than Plymouth. It is more

particularly the great national harbour, the principal nursery of our fleets; and its unrivalled advantages of position and scenery, as well as the romantic and stirring nature of its history, invest it with an importance and consecrate it with associations which none of us can undervalue. only natural defect of its extensive harbour, of the beautiful and picturesque Sound, was its exposure to the southern gales, which would often, at the equinoxes, produce many serious disasters. For its better protection, therefore, successive generations proposed various expedients; but it was not until Earl St. Vincent presided at the Board of Admiralty that the question was seriously discussed. Mr. Rennie was then directed to report in what way an effectual improvement would best be secured, and, after a careful investigation of the subject, he suggested the construction of an enormous sea-wall, or breakwater.

14. He proposed that this breakwater should be of a total length of 5,100 feet; of which 3,000 feet, forming the central part, should extend in a straight line across the Sound, and 1.050 feet at either end incline inwards at an angle of 160°. This was to be formed by throwing into the sea large angular blocks of rubble, of from two to twelve tons each, leaving them to find their own level, and so continuing until a sufficient mass was raised to the level of halftide, to make a ridge, about seventy yards broad at the base, and ten yards at the summit. The plan was so simple and yet so bold that, of course, it was decried at once as visionary and impracticable, or, if pronounced feasible, as certainly calculated to destroy the Sound for purposes of navigation. Counter projects were put forth; a war of pamphlets ensued; and five bitter years of controversial strife elapsed before Rennie's design was finally adopted. In June 1811, however, an Order of Council authorised its prosecution; Rennie was appointed engineer in chief, and Mr. Whidbey assistant engineer. The first stone was deposited on the Shovelbank Rock, nearly in the centre of the work, on August 12, 1811, and thenceforward the operations were carried on with as much despatch as the weather would admit. Undaunted by the cavils of disbelievers, Rennie steadily continued to elaborate his design. In March 1813, portions of this novel sea-wall were visible at low water, and by the end of July there appeared a continuous line of about 720 yards. August 14, 1815, not less than 615,057 tons of stone had been deposited, and a length of 1,100 yards was raised above the low-water mark of spring tides. The sceptical were now silenced, and the resolute engineer received the

eulogiums he deserved.

15. This grand achievement, of which the nation may be justly proud, was completed in 1848, twenty-seven years after the death of its able projector. It swallowed up 3,670,444 tons of stone, and 22,149 cubic yards of masonry, at a cost of about 1,500,000l., and has rendered Plymouth Sound unrivalled as a capacious haven of refuge for merchant vessels, and a safe harbour for ships of war. It now rests, secure as a rock, upon the bed of the sea, and will doubtless rear its lofty crest above the waters, unshaken and uninjured, when Lord Macaulay's famous New Zealander shall contemplate the ruins of London from a broken

arch of London Bridge!

16. To live, with Rennie, meant—to work. His life was one unremitting labour; the very epopæa of resolute in-His personal enjoyments were summed up in reading, and in the innocent pleasures of the home fireside. He never spent what is called a holiday, for cessation from labour seemed impossible to him. 'Life is short, and art is long,' thought the great engineer, and he made haste to work while it was yet day, ere the night cometh when no man can work. But though a man of simple and austere habits, and, apparently, of commanding physical power, such ceaseless application proved too much for him. The sword wore out the sheath. The bow was over bent, and snapt. He was seized with illness in 1820, but bravely fought against its inroads. The strong man wrestled with disease, like an athlete, for several months. He was constrained to succumb at last. Day by day his strength waned, but he refused to keep his bed, and would occasionally take an airing in his carriage. On October 4, 1821, however, he was unable to get up. His mind. until then had preserved its vigour and sagacity, but now it began to wander. He soon became insensible to all that passed around him, and, after lingering through the weary day in the death-throes, expired, about six in the evening, at the comparatively early age of sixty-one.

17. The two main characteristics of this extraordinary man, who may, perhaps, on the whole, be pronounced the most illustrious of the English engineers, were-perseverance and method. Genius, in the sense in which it is often used, he did not possess; his was not a brilliant, dashing mind, but it was cool, calm, profound, and well balanced. Rennie was the Wellington, rather than the Napoleon, of the engineering world. Like Sir Joshua Reynolds, he held that industry is superior to inspiration. 'If you have great talents,' said Sir Joshua Reynolds, 'industry will improve them; if you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well-directed labour; nothing is to be obtained without it.' And nothing was denied to Rennie's methodical toil and unflinching resolution. 'Method,' said Cecil, 'is like packing things in a box: a good packer will get in half as much again as a bad one.' It was in this way that Rennie accomplished such a multiplicity of undertakings. For forty years he was the projector of, or adviser in, the chief engineering operations of the United Kingdom, but no one ever saw Rennie confused, perturbed, or hurriedly toiling to overtake his proper day's work. He did one thing at a time, and at the right time, and has therefore left as his memorials the Plymouth Breakwater and the three great bridges which span the metropolitan river. Surely, the life of such a man is in itself an inspiration which should warm the blood of youth, and stimulate it to noble effort! Is it not something to bask in the light of such splendid examples, and to know that we come of the same stock as these Heroes of Labour, speak the same tongue, and reverence the same faith?

Ever their phantoms rise before us,
Our loftier brothers, but one in blood;
By bed and table they lord it o'er us,
With looks of beauty and words of good!

JOHN STERLING.

JAMES BRINDLEY.

1. This remarkable man, the prince of the canal-engineers of England, and one of the most striking examples afforded in English biography of natural capacity and resolute will subduing apparently insuperable obstacles, was born in 1716, in a small cottage near the village of Tunstead, in Derbyshire. His birth-place has long since passed away, and left not a vestige behind; but nature has preserved a memorial in a noble ash which grew up amidst the ruins, and still blooms and flourishes, the glory of the country-

side, as 'Brindley's Tree.'

Brindley's father was a village labourer, supporting his family in the main by the proceeds of a small enclosure, or 'croft,' which he rented, and spending most of his time in shooting and hunting, and the once popular pastime of bull-baiting. But he enjoyed, as most men have enjoyed whose careers have become illustrious, the advantage of the fostering care of a good mother. Education he received none, and to the end of his days he could read but with difficulty, and spell but on a phonetic system of his own. Up to the age of 17, he turned his hand to any species of work that fell in his way, occupying his idle hours in mechanical pursuits, and especially in the construction of water-mills; a circumstance which led to his apprenticeship, in 1733, to one Abraham Bennett, wheelwright and millwright, of Sutton, near Macclesfield, for a term of seven years.

2. His début in his new trade was not a promising one. He learnt it by slow degrees, and was considered duller and more obtuse than even ordinary lads. His master was a man of intemperate habits, who handed over his apprentice to the rude practical wit of his journeymen; and these, like most skilled mechanics, were jealous of new-comers, and indisposed to impart to them any portion of their own information. Brindley was thus left to blunder as best he could into a knowledge of his trade. On one occasion, says Mr. Smiles, he had to fit in the spokes of a cart-wheel, and was so intent on completing his job that he did not find out that he had fitted them all in the wrong way until he had applied the gauge-stick. But the lad had a resolute spirit and a determined will. He was bent upon gaining knowledge, and no obstacle could damp his enthusiasm. So it happened that the master who had neglected, and the journeymen who had ridiculed him, were in due time constrained to admit that after all there was something in this stupid apprentice!

3. In the autumn of 1735, Mr. Daintry's silk-mill at Macclesfield having been injured by fire, Bennett was employed to execute the necessary repairs. Whilst his men were engaged at the shop on the new work required, Brindley removed the damaged machinery at the mill, under the directions of Mr. James Milner, the superintendent. His intelligence produced so much impression upon Mr. Milner that he requested Bennett to allow the 'bungling apprentice' to assist in executing the repairs of some portion of the works. Permission was unwillingly given, and the master and his men stood by expectant of the discomfiture which they were prepared to enjoy. can yet remember the delight,' said Brindley, many years afterwards, 'which I felt when my work was fixed and fitted complete; and I could not understand why my master and the other workmen, instead of being pleased, seemed to be dissatisfied with the insertion of every fresh part in its proper place.'

At a supper which celebrated, as is wont, the completion of the contract, Brindley's share in the work was ridiculed by his fellow workmen, whereupon Mr. Milner exclaimed, 'I will wager a gallon of the best ale in the house that before the lad's apprenticeship is out he will be a cleverer workman than any here, whether master or man.' The wager does not appear to have been taken, but was long remembered by its hero, and operated as a great encouragement to him to persevere in deserving the good opinion he had won. Very soon the skill and natural acuteness of 'the apprentice' were recognised by all his master's employers.

who would particularly request that 'the young man Brindley' should be sent them in preference to any other of the workmen. Vainly did his master ask him where he had acquired his knowledge of mill-work. Brindley could only reply that it had come 'natural-like,' for he was unable to follow the workings of his own intellect, which, almost insensibly to himself, was drawing its comparisons and deducing its inferences. But so thoroughly did he do his work, that Bennett actually complained of its excellence. 'Jim,' said he, 'if thou persist in this foolish way of working, there will be very little trade left to be done when thou comes out of thy time: thou knaws primness of work's th' ruin of trade.'

4. About this time Brindley's master entered into a contract for the machinery of a new paper-mill, proposed to be erected on the river Danc. Bennett knew little of the matter, but, to gain the requisite knowledge, proceeded to inspect some paper-mills near Manchester. On his return he had evidently learned so little that it appeared probable he had inspected the Manchester tayerns more closely than the Manchester mills, but, as the job was a lucrative one, he set his men to work in the best way he could. For several days they went on, pulling down and putting up, patching here and bungling there, but making no effectual progress. While thus circumstanced, it happened that a millwright of some experience visited the place, and, looking in upon Bennett's operations, freely expressed his opinion that he knew nothing about the work he had undertaken, and was only flinging away his employer's money. This free-spoken censure came to young Brindley's ears, and he determined to conquer the difficulty, if possible, and bring the undertaking to a satisfactory completion.

5. Without revealing his design, Brindley left the mill when his week's work was ended, and, instead of returning to his master's house, where he lodged, set out alone for Manchester. Great was Bennett's alarm at his non-appearance. Had he run away? It was true that he was only in the fourth year of his apprenticeship, but he was twenty-one,

and might, therefore, have availed himself of his legal majority. Saturday evening passed, and Sunday in due course disappeared, but no Brindley returned, repentant! On Monday morning Bennett proceeded to the chaotic scene of his would-be paper-mill, and there, to his sincere delight, he saw his strayed apprentice working away with indescribable energy. Brindley soon explained the cause of his disappearance. He had walked to Smedley Mill, a distance of twenty-five miles, to examine the machinery there, and had now returned to help his master out of his difficulty. Bennett at once abandoned to him the conduct of the work, and Brindley laboured with such good will and intelligence that it was completed, entirely to the satisfaction of its proprietors, a few weeks within the stipulated time.

Henceforth Bennett gave up the management of his business to his skilful apprentice, who supported his master and his master's family for several years in reasonable comfort, and, on Bennett's death, wound up the concern satisfactorily, and set up in business on his own account at Leek, in Staffordshire (A.D. 1742)

6. The millwright's progress at Leek was such as might have been predicted of a man of his steady determination and extraordinary natural ability. Whatever he did he did thoroughly, and he was always careful to execute his work within the time allotted for its performance. His ingenuity in improving old machinery or inventing new mechanical contrivances procured him in this neighbourhood the sobriquet of the 'Schemer;' and there was scarcely any species of machinery with which he did not seem, as if by intuition, to become thoroughly acquainted. His reputation spread into the pottery districts of Staffordshire, and into the mining regions of Cheshire and Lancashire. Earl Gower was attracted by his readiness of resources, and became one of his steadiest patrons. Flint-mills and silk-mills, the pumping of water, and draining of mines, and smelting of iron and copper—all came alike to Brindley, and in all he introduced some novel improvement, which facilitated labour or rendered easier the operations of the machinery improved. To him may be ascribed the merit of having introduced the process of grinding flints in water, and thus preventing the injury resulting from the inhalation by the workmen of the impalpable powder with which the air of the flint-mills was formerly laden. He improved upon Newcomen's steam-engine, by ensuring a greater economy in the consumption of coal, and would probably have done much more, had not circumstances now turned his inventive

genius into a very different channel.

7. It was in 1759 that Brindley was called into consultation by the Duke of Bridgewater with reference to a canal projected through his Worsley estates for the transit of their coal to Manchester. At this time the imperfect nature of the communications between town and town was such as would seem incredible to us, the children of an age of railways! It took four days and a half to go from Manchester to London, and a coach which, in 1760, was started to perform the journey in three days, was considered justly entitled to the sobriquet of the 'Flying Machine.' The roads in most parts of Lancashire were only adapted for the passage of pedestrians and horsemen, and few, indeed, were practicable for wheeled vehicles. though Manchester lay within a few miles of a rich mining district, it was ill supplied with coals, the carriage alone amounting to nine or ten shillings per ton. Little coal was sent by river, because the Mersey Navigation Company levied a charge of 3s. 4d. per ton for even the shortest distance. The duke, therefore, determined upon a waterway of his own, by which his coal might pass from Worsley to Manchester. Accordingly, in 1759, he obtained an Act of Parliament permitting him to cut a navigable canal from Worsley Mill eastward to Salford, and to carry the same westward to a point on the river Mersey, called Hollin Ferry. He now only required a man to carry out the schemes he had formed with so much promptitude. He found him in James Brindley. No two men were better fitted for association in a difficult undertaking. Both were full of energy, not easily daunted, shrewd, practical, and indefatigable. Both, when they fixed on a particular object, devoted all their powers to secure its accomplishment. Both were men who seemed to rise after every defeat with fresh spirit — Antæus-like, recovering new energy from the fall that appeared to promise victory to their opponents. Both had an originality of view and boldness of conception which delighted in encountering obstacles and devising means for subduing them. The duke was made for Brindley, and Brindley for the duke.

8. The duke at once entrusted Brindley with the execution of his project, and, as a first step, the self-taught engineer made 'an ochilor servey or a ricconitoring' of the ground which the canal had to traverse. He speedily came to a conclusion. The duke had intended to carry the canal down into the Irwell by a flight of locks, and so up again on the other side to the proposed level. Brindley advised that it should be carried right over the Irwell, and so one entire level be maintained throughout. It was evident that his advice, if followed, would necessitate some formidable engineering operations; but it was adopted by the duke, plans were prepared, a new Act obtained from Parliament, and the works commenced.

The most difficult part of the undertaking was, necessarily, the construction of the aqueduct to carry the canal across the Irwell; and you may be sure it was everywhere decreed as the folly of a madman by those pretended wits and shrewd critics who discern so little in the dreams of genius, and yet profess to see through a millstone! To carry ships upon a lofty bridge, over the mast-heads of other ships navigating in the Irwell, which slowly flowed beneath? 'Pshaw,' cried the wise men, 'it is an impossibility! Brindley is a madman or an impostor, and the duke—a fool!' So was Galileo when he said the earth moved, and the Marquis of Worcester when he enunciated the force of vapour. It is fortunate for genius that Time reverses the unjust verdicts of its contemporaries.

But the duke and Brindley persevered, and the madman's dream in due time became a reality. The Barton aqueduct, is called, is about 600 feet long and 36 feet wide, the being sustained by a bridge of three semicircular

arches, the middle one of 63 feet span. 'It carries the canal over the Irwell,' says Mr. Smiles, 'at a height of 39 feet above the river — this head-room being sufficient to enable the largest barges to pass underneath without lowering their masts. The bridge is entirely of stone blocks, those on the faces being dressed on the front, beds, and joints, and cramped with iron. Although the Barton aqueduct has since been thrown into the shade by the vastly greater works of modern engineers, it was unquestionably a very bold and ingenious enterprise, if we take into account the time at which it was erected. Humble though it now appears, it was the parent of the magnificent aqueducts of Rennie and Telford, and of the viaducts of Stephenson and Brunel, which rival the greatest works of any age or country.'

9. Brindley, however, not only constructed the canal. but contrived the whole arrangements and machinery by which it was to be made use of. 'At every point,' to quote again from Mr. Smiles, 'his originality and skill were at work. He invented the cranes for the purpose of more readily loading the boats with the boxes filled with the duke's "black diamonds." He also contrived and laid down within the mines a system of underground railways. all leading from the face of the coal (where the miners were at work) to the wells which he had made at different points in the tunnels, through which the coals were shot into the boats waiting below to receive them. At Manchester, where they were unloaded for sale, the contrivances which he employed were equally ingenious. It was at first intended that the canal should terminate at the foot of Castle Hill, up which the coals were dragged by their purchasers from the boats in wheelbarrows or carts. But the toil was found very great; and, to remedy the inconvenience, Brindley contrived to extend the canal for some way into the hill, opening a shaft from the surface of the ground down to the level of the water. The barges having made their way to the foot of this shaft, the boxes of coals were hoisted to the surface by a crane, worked by a box water-wheel of 30 feet diameter and 4 feet 4 inches wide, driven by the waterfall of the river Medlock. By these means the coals were rapidly raised to the higher ground, where they were sold and distributed, greatly to the convenience of those who came to purchase them.'

10. The remainder of Brindley's laborious career was occupied in canal engineering, and each successive work served to bring out more fully the remarkable qualities of the man—his exhaustless invention, his persistent energy, his resolute grappling with difficulties, and novel powers of combination. We can but enumerate the more notable of his achievements. He extended the Duke's Canal from Manchester to the Mersey at Kempstones, a project which the duke had to carry through parliament in the face of a most virulent opposition. Its course is about 24 miles long, and involves a series of engineering difficulties of no ordinary character. It is constructed nearly all the way on a dead level, and has always been considered as among the most striking evidences of Brindley's skill and genius. The Grand Trunk Canal, uniting the Mersey with the Trent, and both with the Severn, and connecting the ports of Liverpool, Hull, and Bristol, is another monument to the great engineer's genius. It starts from the Duke's Canal, at Preston-on-the-Hill, near Runcorn, passes southward by Northwich and Sandbach, cuts through the hill at Harecastle, traverses the Pottery districts of Burslem-Stoke, and Fenton, moves onward by Trensham and Shulborough to Haywood, follows the valley of the Trent until it turns to the north-east at Lichfield, whence it proceeds to a junction with the main river at Wilden Ferry. From this point the navigation of the Trent lies open, by way of Newark and Gainsborough, to the Humber. The first sod of this important canal was cut by Josiah Wedgwood, on July 26, 1766. Its entire length is 1391 miles, and it has but 75 locks. Its whole rise, from the level of the Mersey to the summit at Harcastle, is 395 feet, and its fall from thence to the Trent at Wilden Ferry, 288 feet 8 inches. Its width is 31 feet, and its depth $5\frac{1}{8}$ feet. Across the Dove it is carried upon an aqueduct of 23 arches. approached by an embankment on either side, in all 11 m.

in length. There are five tunnels, the Harcastle, 2,880 yards long; the Hermitage, 130 yards; the Barnton, 560 yards; the Saltenford, 350 yards; and the Preston-on-the-Hill, 1,241 yards.

Other canals laid out and executed by Brindley were—the Staffordshire and Worcestershire (46 m.), the Coventry (36 m.), the Birmingham (24 m.) the Droitwich (5 m.), the Oxford (82 m.), and the Chesterfield (46 m.)

11. Hard work, acting upon a constitution already weakened by constant exposure to all weathers, overthrew Brindley at a comparatively early age. He died of diabetes, at his house at Turnhurst, on September 27, 1772, in the 56th year of his age.

Brindley was one of those great geniuses who occasionally appear, to light up the age in which they live, by the force and originality of their character, quite as much as by the . lustre of their deeds and the splendour of their achievements. He seemed to arrive at his conclusions, not by the slow process of consecutive reflection, but by a sudden intuition, by a remarkable instinct which jumped at once to the end desired. His fertility of resource was equally wonderful. No difficulty could impede or delay him. A remedy was at his fingers' ends, which always proved to be the best, and indeed the only correct one that could be applied. His mode of study was eminently characteristic of the man. 'Having little or no assistance from books or the labours of other men,' says his brother-in-law, Mr. Henshall, 'his resources lay within himself. In order, therefore, to be quiet and uninterrupted whilst he was in search of the necessary expedients, he generally retired to his bed; and he had been known to be there one, two, or three days, till he has attained the object in view. He would then get up and execute his design, without any drawing or model. Indeed, it was never his custom to make either, unless he was obliged to do it to satisfy his employers. His memory was so remarkable that he has often declared that he could remember and execute all the parts of the most complex machine, provided he had time, in his survey of it, to settle in his mind the several parts and their relations to each other. His method of calculating the powers of any machine invented by him was peculiar to himself. He worked the question for some time in his head, and then put down the results in figures. After this, taking it up again at that stage, he worked it further in his mind for a certain time, and set down the results as before. In the same way he still proceeded, making use of figures only at stated parts of the question. Yet the ultimate result was generally true, though the road he travelled in search of it was unknown to all but himself, and perhaps it would not have been in his power to have shown it to another.'

12. Brindley's success in life was emphatically the result of his entire devotion of his great mental powers to the assiduous cultivation of the profession he had embraced. Taking him as an example to be followed, we may point out to our young readers an instance to be avoided, in a man of scarcely less notable intellectual gifts, which were marred and rendered nugatory by his instability of character.

'Lawrence Earnshaw, of Mottram, was a very poor man's son, and had served a seven years' apprenticeship to the trade of a tailor, after which he bound himself apprentice to a clothier for seven years; but these trades not suiting his tastes, and being of a strongly mechanical turn, he finally bound himself apprentice to a clockmaker, whom he also served for seven years. This eccentric person invented many curious and ingenious machines, which were regarded as of great merit in his time. One of these was an astronomical and geographical machine, beautifully executed, showing the earth's diurnal and annual motion, after the manner of an orrery. He was also a musical instrument maker and music teacher, a worker in metals and in wood, a painter and glazier, an optician, a bell-founder, a chemist and metallurgist, an engraver—in short, an almost universal mechanical genius. But this was his ruin. He did, or attempted to do, so much, that he never stood still and established himself in any one thing; and, notwithstanding his great ability, he died "not worth a groat," in

1764, at 60 years of age.'* Of him, in a lesser degree, may be said what Robert Nicoll, the poet, said of Coleridge: 'What a mighty intellect was lost in that man for want of a little energy—a little determination.' Alas, how many fine intellects have been wasted in the vain attempt to spread their gold over too wide a surface! The stream, that, pent up in one narrow channel, will bear down any obstacle against which it may be directed, falls off in spray, and vapour, and wasteful waters when suffered to spread abroad wherever it may will.

EPILOGUE.

- 1. We have dwelt at some length upon the lives of our great inventors and distinguished engineers, — upon the careers of those famous minds who have subdued matter and conquered space,—because in these the rare virtues of perseverance and application are eminently displayed. In no profession, indeed, are they more needful; in none more brilliant in result. The man who bores a hole through the solid rock, or carries a massive aqueduct across an arm of the sea, or links city to city by chains of iron which bind them in indissoluble communion, must be content with a gradual progress, and work out his grand results by an accumulation of slow and elaborate processes. It is not for Humanity to imitate the Divine: 'Let there be light, and there was light.' Man builds up his mighty works by painful degrees. Inch by inch the billows are beaten back from the land; stone upon stone rises the breakwater out of the sea. Nothing great will be accomplished, nothing good, by him who is not patient in labour and constant in well-doing.
- 2. The men at whose history we have so briefly glanced in the preceding pages gained what the vulgar would call 'success in life.' They rose from the lowest ranks of society; they won fame and secured wealth. But think you that Brindley rejoiced most when he invested his money
- * Condensed from a notice in Smiles' valuable book, the 'Lives of the Engineers.'

in lucrative shares, or when the water first rolled into the Bridgewater Canal? Which was dearer to Watt?—the moment when his steam-engine stood before him, perfect, complete, a veritable living and moving thing, or the hours when he cast up the balance of his yearly profits? When Palissy saw the glaze shine upon the potsherd in his furnace, he felt a keener pleasure than all the gains of his later life procured him. It is enough, then, for the true and earnest man to succeed in accomplishing the end to which his powers have been devoted, even if his name be never trumpeted by the world's tongue, and his feet never reach the bank of a golden Pactolus! Brindley, Watt, Arkwright, Stephenson, did not measure success by the worldly standard of £ s. d.

3. But while so strongly inculcating upon our readers the absolute importance of devoting their powers to a chosen pursuit if they would satisfy themselves, or rise above the common herd, it is needful we should guard against being seriously misunderstood. All knowledge is good, and narrow must be the intellect which can confine itself to one subject only. We do not advise the study of a special theme to the exclusion of all others; but that, while gathering information from every side, you still keep steadily in view the particular goal of your arduous pilgrimage. The river rolls onward, and still onward, to the sea, but does not disdain to drink in the streams which well through the valleys, or the torrents which leap from the mountains on The late Lord Chancellor Campbell was a its course. sound lawyer, but not the less an accomplished man of letters. Mr. Gladstone regulates the finances of the British empire, and writes treatises upon Homer. Henry Bickersteth was Master of the Rolls, and rose to the House of Peers as Baron Langdale, but he was also no indifferent physician. Watt, who invented the steam-engine, was an excellent botanist. Nasmyth, who invented the steamhammer, is an admirable artist. We might multiply examples ad libitum, but have probably said enough to show that superiority in one pursuit does not imply ignorance or neglect of every other. Only, we must be careful

not to attempt too much. Divide et impera is not true as far as regards a man's life-labours. The point once determined at which we mean to arrive, we must turn neither to the right nor the left, but press forward through doubt, discouragement, and difficulty—

To strive, to seek, to find, and not to yield.

CHAPTER II.

EXAMPLES AND ENCOURAGEMENTS FROM THE LIVES OF NAVAL AND MILITARY HEROES.

The great art of commanding is to take a fair share of the work. The man who leads an army cannot succeed unless his whole mind is thrown into his work. The more trouble. the more labour must be given; the more danger, the more pluck must be shown, till all is overpowered.

GEN. SIR C. J. NAPIER.

Who is the happy warrior? who is he Whom every man in arms should wish to be? . . . It is the generous spirit who, when brought Among the tasks of real life, hath wrought Upon the plan that pleased his childish thought: Whose high endeavours are an inward light, That make the path before him always bright. . . . Who, whether praise of him must walk the earth For ever, and to noble deeds give birth; Or he must go to dust without his fame, And have a dead, unprofitable name, Finds comfort in himself and in his cause; And, while the mortal mist is gathering, draws His breath in confidence of Heaven's applause: This is the happy warrior—this is he Whom every man in arms should wish to be.

WORDSWORTH.

PROLOGUE.

1. There is no form, perhaps, in which success in life appears more attractive to the vulgar eye than in the plume that glitters on the marshal's crest, the stars and crosses which decorate the victorious warrior. The 'pride, pomp, and circumstance' of a soldier's life have always had

- a peculiar fascination for the multitude, and many an ambitious spirit has grasped the sword or shouldered the musket, seduced by the blazonry of war, and the splendour of the prizes which fall to the arbiters of battle. Peerages and knighthoods-stately palaces and fertile acres-the favour of kings and the smiles of courts—the marshal's baton, and, perhaps, the monarch's sceptre—these are the stakes for which the soldier contends. And how easy a matter it seems to the young and unthinking to secure these glorious guerdons! A dashing charge—the leadership of a forlorn hope—a successful skirmish—it is by such deeds (so dream the thoughtless) that Marlborough won Woodstock, Wellington his dukedom, and Colin Campbell his seat among the peers. Alas, where the prizes are so splendid, the blanks are always numerous! For few of the rank and file does Fortune retain her crosses or her coronets, and something more than mere valour—which is the virtue of the many—is needful to deserve them.
- 2. Consider what noble qualities are required to make up the great general—the Agamemnon, or 'leader of men.' Energy of will, which conquers obstacles and inspires others in the attempt to conquer them; a fixed unalterable purpose; the highest quality of patience; the capacity which conceives, and the resolution which carries out; temperance, perseverance, intuitive knowledge of character; promptitude of decision, wealth of resource; zeal, truthfulness, pluck, -truly, a Wellington, a Marlborough, or a Turenne is almost a perfect man! Above all, the great soldier must be firm in his pursuit of a particular object—whether it is a fortress to be captured, a convoy to be surprised, or an enemy beguiled into an ambuscade. Whatever he finally resolves upon he must execute, though ever so many hostile cannon thunder. Nay! will—force of purpose determination—call it by any name you please—is the successful warrior's prime virtue; 'aut viam faciam aut inveniam' is the very secret of his genius. It was thus that Charles XII. raised petty Sweden to the rank of a great military power, and it was thus that Peter the Great was enabled to crush him at Pultowa. Muley Moluc, the

famous Moor, was sickening of an incurable malady, when his soldiers came in sight of the Portuguese army. He sprang from his litter—he mounted his horse—led his army to the charge, and conquered. The victory won, he fell back in the arms of his attendants, and expired. Suwarrow, the illustrious Russian general, would not believe that any man could fail if he willed; and everybody knows Napoleon's celebrated saying—'Impossible? There's no such word in the dictionary!' Sir Bulwer Lytton relates a striking anecdote of the late Earl of Dundonald. During the Russian war, he went to a minister of State, and proposed to destroy Cronstadt. 'You must give me so many men of war and frigates, and certain materials, and I will destroy Cronstadt! But if you do not destroy Cronstadt?' questioned the timid statesman. 'Why, there's an end of the British fleet!' An end of the British fleet!—the minister bowed out . the earl, appalled. But the brave old admiral meant to say that he would destroy Cronstadt, and that it was just as likely the whole British fleet should perish, which was one impossibility, as that he should fail, which was another impossibility. You see the minister of State did not comprehend the force of the I will!

3. It was a fine saying of Napoleon:—'Do you suppose that if I had not been general-in-chief, and the instrument of fate to a mighty nation, that I would have accepted place and dependence! No! I would have devoted myself to the study of the exact sciences; and since I have always succeeded in my great enterprises, I should have highly distinguished myself also in my scientific labours. I should have left the memory of beautiful discoveries.' No hesitation, no doubt, no faltering here; all the strong 'I will' of a strong man. Mere skill in tactics, or dexterity in manœuvres, will never make a great commander. 'The knowledge of warfare,' says Fuller, 'is thrown away on a general who dares not make use of what he knows.'

4. Next to 'will' in a successful soldier's virtues we should place 'patience.' 'They also serve,' says Milton, 'who only stand and wait.' To know how and when to wait is of vital importance on the battle-field, or in the

conduct of a brilliant campaign. It was Wellington's waiting behind the fortifications of Torres Vedras that defeated the brilliant genius of Massena, and drove the French from the Peninsula. Marlborough's patience in front of the famous lines constructed by the great Villars, completely outwitted that illustrious marshal. Most of Turenne's successes were gained by his patience, while the great Condé was so often defeated because he knew not how to wait. It was De Maistre who said that 'to know how to wait is the secret of success.' And Nelson:—'I owe all my success in life to having been always a quarter of an hour before my time.' He waited fifteen minutes, and then seized the opportunity, which never waits.

5. 'Promptitude' is another secret of success with the 'gods of war.' Blucher was always ready: hence his soldiers nicknamed him Marshal Vorwaertz (forward). When Lord Clyde was appointed to the chief command of the Indian army, and was asked how soon he could start for the scene of action, his answer was: 'In twenty-four hours.' So, too, Sir John Jervis, to whom the enquiry was addressed, when could he join the ship to which he was appointed? replied, 'Directly!' Men who can wait can always be prompt, because they have time to consider what they will do, and when the fitting moment comes, they do it! Clive's promptitude saved British India at Plassey. Nelson's promptitude in detecting and preventing an able manœuvre of the Spanish admiral's, won the victory off Cape St. Vincent.

6. 'Purpose' is another essential of success in the soldier's profession, as in the peaceful pursuits of art, science, or literature. A ship without a rudder would be at the mercy of wind and wave: so is a man without a purpose. The late gallant Indian general, the lamented Nicholson, was emphatically a man of purpose, and on one occasion, during the great Indian mutiny, while in pursuit of an insurgent regiment, he kept his saddle for twenty consecutive hours, and rode upwards of seventy miles. In his epitaph he is rightly characterised as having possessed 'an iron mind and frame, a terrible courage, an indomitable will.

Few,' continues the eulogium, 'took a greater share in the conquest or government of the Punjab; perhaps none so great in both. To the last he was in that province a tower of strength. His form seemed made for an army or a people to behold, his heart to meet the crisis of an empire. Soldier and civilian, he was the type of the conquering race.'

- 7. Equally eminent for persistent purpose was the late Sir Charles James Napier, the hero of Sobraon, Aliwal, and Meanee. If beset by difficulties, he would exclaim, 'They only make my feet go deeper into the ground.' No danger daunted, no obstacle discouraged that ardent resolute spirit. With 400 English and 1,600 Sepoys he shattered to pieces, at Meanee, a well-armed Beloochee force, mustering 35,000 sabres! 'A watch, a razor, a piece of soap, and a brush, were equipments enough,' said this man of purpose, for any campaigner in India. To make England supreme was Napier's purpose, and wherever his arms advanced he accomplished it. 'Is there one,' said John Hunter, 'whom difficulties dishearten—who bends to the storm? He will do little. Is there one who will conquer? That kind of man never fails.' The young Nelson, who did not know 'what fear' was, became the victor of Aboukir, Copenhagen, and Trafalgar. And Wellington, who flinched not at Assaye, conquered at Waterloo.
- 8. Success as a soldier, then, it is evident, can only be obtained by him who devotes all his powers to the profession he has chosen—patience, energy, courage, purpose—concentrating them all in one burning focus, which melts down every obstacle. He who so abandons himself to his aim shall assuredly accomplish it. Let him not, indeed, like the French soldier, conclude that a marshal's baton lies concealed in every private's knapsack. He may remain one of the rank and file, or never rise beyond the sergeant's halbert, and yet his career be a success. If he resolutely do his duty; if he live a man's manly life of truth, honesty, and perseverance; if he seek to imprové to the utmost those faculties which he possesses; if he develope his heart, and mind, and soul, until he sympathises with all that is good, and beautiful, and noble; is he not successful? Shall not

angel-hands place on his glowing brow a crown felt even if unseen? The joy of a true man is in the struggle, not in the prize. 'The pursuit of knowledge,' said the Marquis of Halifax, 'has a pleasure in it like wrestling with a fine woman.' And the consciousness of duty performed, purpose achieved, hope fulfilled is a source of more exquisite and enduring happiness than the gauds which dazzle the eyes of little men!

EXAMPLES.

From the lives of certain illustrious naval and military heroes we now proceed to illustrate in detail the maxim which this book sets forth;—and the first place we give to that noble old sea-king—ultimus Romanorum—who but recently has passed away from among us:-

THOMAS, EARL OF DUNDONALD.

1. Thomas Cochrane, Earl of Dundonald, was born at Aunsfield, Lanarkshire, on December 14, 1775. He was the son of Archibald, ninth earl, a man of much ingenuity, but little prudence, who contrived by ill-directed scientific pursuits so far to reduce an already impoverished inheritance, that he was verily a pauper though a peer. His son's position as heir to an earldom without an income

was, therefore, at the outset, an unfortunate one.

2. When but nine years old, he lost his mother—a sad affliction for her irregularly administered family, and it is probable he and his five brothers would have been flung upon the world without an education, had not their grandmother applied her small income to meet their exigences. 'By the aid thus opportunely afforded,' says the earl, 'a tutor was provided, of whom my most vivid recollection is a stinging box on the ear, in reply to a query as to the difference between an interjection and a conjunction; this solution of the difficulty effectually repressing further philological enquiry on my part.' A Monsieur Durand succeeded to the post vacated by this pugilistic teacher, but his reign was prematurely terminated by certain Papistical ways which gave offence to the strict Presbyterian orthodoxy of

the neighbours of the Dundonald family.

- 3. The young lord's passion for a naval life began to manifest itself in his very boyhood. But his father, though a man of science, was not a man of sagacity, and disregarding the boy's evident bias, determined he should enter the army. His uncle, the Honourable Captain, afterwards Admiral, Sir Alexander Cochrane, better understood his nephew's character and disposition, and assured that he would, sconer or later, enter the naval service, he enrolled his name, as a useful precaution, on the books of several vessels under his command,—the object being, to give him a few years' standing in the profession, should he eventually adopt it. Meanwhile, a kinsman of influence procured him an ensigncy in the 104th Regiment, so that Lord Cochrane had the honour of belonging to both services at the same time.
- 4. He had now another opportunity of making some small progress in his studies, being placed at an academy in Kensington for six months. Four years and a half then elapsed at home, in the zealous acquisition of knowledge from such books as he could procure, until his father, moved by his extraordinary industry, quiet perseverance, and the unalterable character of his attachment to a seafaring life, consented that his commission should be cancelled, and the renewed offer of his uncle to receive him on board his own frigate accepted. Accordingly, he joined the Hind, at Sheerness, on June 27, 1793, at the advanced age, for 'a young gentleman,' of seventeen years and a half.
- 5. His introduction to a naval career was marked by an amusing incident. The first lieutenant of the Hind was an 'old salt,' a seaman of the time of Benbow and Boscawen, who had notions of his own, and very limited ones, respecting a midshipman's fitting equipment. Regarding with portentous gaze the magnitude of Cochrane's sea-chest, he exclaimed, 'Does Lord Cochrane think he is going to bring a cabin aboard? The service is going to the devil! Get it up on the main-deck.' The carpenter, under his

directions, then proceeded to saw off one end of the chest just beyond the keyhole, while the lieutenant commented on the lubberliness of shore-going people in not making keyholes where they could most easily be got at,' namely, at the end of a chest instead of at the middle! Notwithstanding this inauspicious beginning, Cochrane and Lieutenant Larmour were afterwards upon excellent terms, from the assiduity with which the young midshipman discharged his professional duties, and his zealous desire to make himself master of the minutest details.

6. After a cruise upon the Norwegian coast, the Hind returned to Sheerness, and Cochrane followed his uncle aboard the Thetis, a larger and more powerful frigate, then equipping for service in North America. She was attached to Admiral Murray's squadron, destined to operate against the French possessions, and arrived at Halifax early in 1795. Cochrane's attention to his duties was now rewarded by his promotion to the rank of third lieutenant, an incentive to renewed exertions and redoubled zeal, which, in their turn, again met with a due reward,—his appointment to a lieutenancy on board the flag-ship of Admiral Vandeput, Admiral Murray's successor in the command, on June 21, 1797. In the following year he returned to England, having served five years upon the North American station, and gained a high reputation as a diligent and promising officer.

7. He next joined the flag-ship of Lord Keith (despatched to relieve Lord St. Vincent in the command of the Mediterranean fleet), as a supernumerary, and on his arrival at Gibraltar (December 1798) received an appointment as acting lieutenant on board the Barfleur. In this capacity he served in the blockade of Cadiz, and in that pursuit of the Brest fleet which Earl St. Vincent so singularly interrupted. While at Palermo he made the acquaintance of Lord Nelson, from whom he received the characteristic injunction, 'Never mind manœuvres; always go at them'—i.e. at the enemy—an injunction which Cochrane, in his after career, took care to follow. As yet, however, he

had had few opportunities of 'a brush with the Mounseers,' or of displaying his remarkable personal courage.

8. The first occasion presented itself on the evening of September 21, 1799, when Lord Keith had his flag flying on board the Queen Charlotte, in Gibraltar Bay. The 10-gun cutter Lady Nelson, was then observed off the African coast, pursued by a number of gun-vessels and privateers. Lord Keith immediately ordered out the boats to her relief, First Lieutenant Bainbridge taking command of the barge, and Cochrane of the cutter. Before the boats got up, the Lady Nelson had surrendered, but Lieutenant Bainbridge, with his 16 men, made a gallant dash at her, boarded, and retook her, killing several, and taking prisoners 7 French officers and 27 men. Cochrane, in the cutter, with 13 men, pulled alongside the nearest privateer, and leaped on board, but, to his intense mortification, his boat's crew refused to follow. Regaining the cutter, he reproached them with their infamy; for the privateer's men had deserted the deck, the helmsman alone being at his post. They could not, however, be taunted into acting like British seamen, declaring that there were indications of the pri-

9. Lord Cochrane was now appointed to an independent command, having the brig Speedy placed under his orders -a miniature vessel of war, of only 158 tons, carrying fourteen 4-pounders, a species of gun little larger than a blunderbuss, and a crew of 84 men and 6 officers. Despite her insignificant character, the young commander was very proud of his tiny vessel, 'caring nothing,' he says, 'for her want of accommodation, though in this respect her cabin merits passing notice. It had not so much as room for a chair, the floor being entirely occupied by a small table, surrounded with lockers, answering the double purpose of store-chests and seats. The difficulty was to get seated, the ceiling being only five feet high, so that (says Lord Cochrane) the object would only be accomplished by rolling on the locker, a movement sometimes attended with unpleasant failure. The most singular discomfort, however, was that my only practicable mode of shaving consisted in removing

vateer's crew having fortified themselves below.

the skylight and putting my head through, to make a toilet-

table of the quarter-deck.'

10. Genius is the power of conquering difficulties, and Lord Cochrane, in this miserable little barque, contrived to render greater services to his country than many a captain of a first-rate man-of-war. In his interesting autobiography he notices them in detail, though with excellent modesty; but our space limits us to a few passing extracts. 'On May 10, 1800, he rescued a Danish brig, and captured her assailant, a French privateer of 6 guns and 48 men. June 16.—Captured a tartar. June 25.—Took out from under the guns of a fort near Bastia a Spanish letter of marque of 10 guns and 38 men, and maintained a running fight with five gunboats. July 6.—Cut out a Spanish vessel, though protected by land batteries. July 19, 27, and 31.—Each day signalised by a gallant action.

December 15.—Off Majorca. Several strange vessels being in sight, singled out the largest and made sail in chase; shortly after which a French bombarde bore up, hoisting the national colours. We now cleared for action, altering our course to meet her, when she bore up between Dragon Island and the Main. Commenced firing at the bombarde, which returned our fire; but shortly afterwards, getting closer in shore, she drove on the rocks. Three other vessels being in the passage, we left her, and captured one of them, the La Liza, of 10 guns and 33 men, bound from Alicant to Marseilles. Took 19 of our prisoners on board the Speedy. As it was evident that the bombarde would become a wreck, we paid no further attention to her,

but made all sail after the others.

'December 18.—Suspecting the passage between Dragon Island and the Main to be a lurking-place for privateers, we ran in again, but found nothing. Seeing a number of troops lining the beach, we opened fire and dispersed them, afterwards engaging a tower, which fired upon us. The prisoners we had taken proving an incumbrance, we put them on shore.

'December 19.—Stood off and on the harbour of Palermo, where we saw several vessels at anchor. Hoisted

Danish colours, and made the signal for a pilot. Our real character being evidently known, none came off, and we

did not think it prudent to venture in.'

We have made these few extracts in illustration of what may be done, even with apparently trivial means, by an earnest determined spirit. An axe in an infant's hand is of less value than a broken blade wielded by a resolute arm. But the capture of the Spanish xebec frigate El Gamo, is an achievement of which the British Navy may rightly be proud, and which, in every respect, displays the peculiar humour and dashing courage of Lord Cochrane.

11. On May 6, 1801, the Speedy, having on board a crew of only 54 officers and men, sighted, while off Barcelona, the Spanish xebec El Gamo, mounting twentytwo long 12-pounders on her main-deck, and eight long 8-pounders and two heavy carronades on her quarter-deck and forecastle, and manned by 319 officers and men. As the Spaniard was evidently in search of the Speedy, Lord Cochrane, instead of attempting an escape, boldly prepared for action, to the hearty gratification of his gallant followers, who had served long enough under him to become imbued with his own spirit. Accordingly, they made all sail to meet their foe. About half-past 9 A.M. he fired a gun and hoisted the Spanish flag, which Cochrane acknowledged by showing American colours, with the object of puzzling the Gamo while he got on the other tack to avoid her full broadside. This accomplished, up to the masthead ran the immortal Union Jack.

12. Receiving a couple of broadsides without damage, the Speedy, which had hitherto not fired a gun, gallantly ran under her powerful antagonist's lee, locked her yards among his rigging, and in this position poured in her mimic artillery. 'To have fired our pop-gun 4-pounders at a distance,' says Lord Cochrane, 'would have been to throw away the ammunition; but the guns being doubly, and, as I afterwards learned, trebly shotted, and, being elevated, they told admirably upon her main-deck, the first discharge, as was afterwards ascertained, killing the Spanish captain

and the boatswain.'

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THE GALLANT LITTLE 'SPEEDY:'

A Leaf from the Life of Lord Dundonald.

13. We continue the narrative in the gallant captain's own graphic language. 'My reason,' he says, 'for locking our small craft in the enemy's rigging was the one upon which I mainly relied for victory, viz. that from the height of the frigate out of the water, the whole of her shot must necessarily go over our heads, whilst our guns, being elevated, would blow up her main-deck. The Spaniards speedily found out the disadvantage under which they were fighting, and gave the order to board the Speedy; but as this order was as distinctly heard by us as by them, we avoided it at the moment of execution by sheering off sufficiently to prevent the movement, giving them a volley of musketry and a broadside before they could recover themselves.' Twice was this manœuvre repeated, and twice thus averted. The Spaniards, finding that they were only punishing themselves, gave up further attempts to board, and stood to their guns, which were cutting up our rigging from stem to stern, but doing little further damage; for after the lapse of an hour, the loss to the Speedy was only 2 men killed and 4 wounded.

'This kind of combat, however, could not last. Our rigging being cut up, and the Speedy's sails riddled with shot, I told the men that they must either take the frigate or be themselves taken, in which case the Spaniards would give no quarter, whilst a few minutes energetically employed on their part would decide the matter in their own favour.

'The doctor, Mr. Guthrie, volunteered to take the helm. Leaving him, therefore, for the time, both commander and crew of the Speedy, the order was given to board, and in a few seconds every man was on the enemy's deck—a feat rendered the more easy as the doctor placed the Speedy close alongside with admirable skill. For a moment the Spaniards seemed taken by surprise, as though unwilling to believe that so small a crew would have the audacity to board them; but soon recovering themselves, they made a rush to the waist of the frigate, where the fight was for some moments gallantly carried on. Observing the enemy's colours still flying, I directed one of our men immediately to haul them down, when the Spanish crew, without pausing

to consider by whose orders the colours had been struck, and naturally believing it the act of their own officers, gave in, and we were in possession of the Gamo frigate, of thirty-two heavy guns and 319 men, who an hour and a half before had looked upon us as a certain if not an easy prey. Our loss in boarding was Lieutenant Parker, severely wounded in several places, 1 seaman killed and 3 wounded, which, with those previously killed and wounded, gave a total of 3 seamen killed, and 1 officer and 17 men wounded. The Gamo's loss was Captain Don Francisco de Torres, the boatswain, and 13 seamen killed, together with 41 wounded; her casualties thus exceeding the whole number of officers and crew on board the Speedy.

'Shortly before boarding an incident occurred which, by those who have never been placed in similar circumstances, may be thought too absurd for notice. Knowing that the final struggle would be a desperate one, and calculating on the superstitious wonder which forms an element in the Spanish character, a portion of our crew were ordered to blacken their faces, and what with this and the excitement of combat, more ferocious-looking objects could scarcely be imagined. The fellows thus disguised were ordered to board by the head, and the effect produced was precisely that calculated on. The greater portion of the Spaniard's crew was prepared to repel boarders in that direction, but stood for a few moments as it were transfixed to the deck by the apparition of so many diabolical-looking figures emerging from the white smoke of the bow guns; whilst our other men, who boarded by the waist, rushed on them from behind, before they could recover from their surprise at the unexpected phenomenon.'

14. Notwithstanding the brilliancy of this achievement, Lord Cochrane, whose energy and plain speaking had made him many enemies, was not promoted to a post-captaincy until the August following; and his urgent applications for a similar acknowledgement of the gallant services of Lieutenant Parker brought down upon him the powerful hostility of Earl St. Vincent. Cochrane, however, when he had an object in view, was no respecter of persons; and

- to Lord St. Vincent's plea that 'it was unusual to promote two officers for such a service—besides which the small number of men killed on board the Speedy did not warrant the application,' boldly replied, that 'his reasons for not promoting Lieutenant Parker were in opposition to his lordship's own promotin to an earldom, as well as that of his flag-captain to knighthood, and his other officers to increased rank and honour; for that in the battle from which his lordship derived his title there was only one man killed on board his own flag-ship, so that there were more casualties in my sloop than in his line-of-battle ship.'
- 15. Cochrane now applied to the Admiralty for another vessel, but met, of course, with a very decided refusal, and his active spirit, thus debarred from 'hair-breadth 'scapes' at sea, entered into an energetic investigation of naval abuses ashore. During the great war with France the corruption, peculation, and inefficiency which prevailed in many departments were most monstrous, and Cochrane obtained evidence of 'facts' which, if exposed to the public, could not but have stirred up an overwhelming storm of indignation. But no immediate opportunity offering, he betook himself to the University of Edinburgh, to prepare himself by study and self-culture for a parliamentary career.
- 16. On the renewal of the war with France, which followed the rupture of the treaty of Amiens in 1803, Lord Cochrane again applied to the Admiralty for a ship, and, after repeated refusals, succeeded in obtaining an appointment to a collier which had been converted into a war-ship, and was named on the 'lucus à non lucendo' principle, the Arab! This ill-built tub sailed so badly that her captain had no opportunity of making prizes or harassing the enemy, and, indeed, as if to prevent him from increasing either his fortune or fame, the Arab was ordered into the North Sea to protect the fisheries, which needed no protection, because, north-east of the Orkneys there were none to protect. Of this protracted cruise, or rather exile, it is enough to say that it was happily terminated on December 1, 1804. On his return to England Cochrane

found Lord Melville at the head of the Admiralty, who relieved him of the dreary Arab, and promoted him to the command of the Pallas, a new fir-built frigate of 32 guns. In his new ship the active seaman soon showed of what good service he was capable. In succession he captured four nobly-laden Spanish vessels, one of which had no less than 450,000 dollars on board, and whose arrival at Plymouth, one after another, in the space of a month,

caused no slight sensation.

17. Lord Cochrane's share of the prize money was sufficient to justify him in carrying out his long-cherished design of entering Parliament, and he accordingly contested the borough of Honiton with a Mr. Bradshaw. But being too conscientious a politician, and too honest a man, to resort to bribery, he was soundly beaten. The use he made of his defeat was characteristic of the man: 'Having had decisive proof,' he says, 'as to the nature of Honiton politics, I made up my mind that the next time there was a vacancy in the borough, the seat should be mine without bribery. Accordingly, immediately after my defeat, I sent the bellman round the town, having first primed him with an appropriate speech, intimating that "all who had voted for me might repair to my agent, and receive 10l. 10s.!" The novelty of a defeated candidate paying double the price expended by the successful one—or, indeed, paying anything—made a great sensation. The impression produced on the electoral mind by such unlooked-for liberality was simply this—that if I gave ten guineas for being beaten, my opponent had not paid half enough for being elected.' Cochrane, consequently, became exceedingly popular; his opponent fell into grievous disrepute, and at the next election, Cochrane was triumphantly returned. But true to his principles he would not bribe, and after the poll was closed, the electors who had voted for him under the impression that they should receive another ten, or, perhaps, even twenty guineas, found that their nautical member had completely outwitted them.

18. In May 1805, the Pallas again sailed from Portsmouth in charge of a convoy for Quebec, and, this duty

successfully accomplished, returned to England in December. She was then attached to the squadron of Admiral Thornborough, destined to operate on the French and Spanish coasts. Her career was marked by the same energy and enterprise that had rendered the cruises of the Speedy famous, and numerous prizes fell to her share, often under circumstances of peculiar hazard. On one occasion the Pallas, when half her crew were away in boats, chased, drove on shore, and destroyed a French 24-gun ship, a 22-gun ship, and a corvette of 18 guns.

19. But, probably, these achievements were surpassed by the feats of arms performed by our sea-lion and his gallant followers during his command of the Impérieuse. He was appointed to that frigate on August 23, 1806, and the crew of the Pallas was at the same time turned over to She left Plymouth on November 17, and joining the blockading squadron in Basque Roads on the 29th, was immediately ordered on a cruise in the vicinity. To capture prizes, or drive ships ashore, however, was not enough to content the ardent spirit of Cochrane, whose one steady aim it was to serve his country with all his might, and harass her enemies whenever and wherever he found them. He would man his boats, pull ashore, and carry a battery by assault; spike the guns, blow up the forts, and return, with the coolness of audacity, in triumph to the Impérieuse. He was none of your arithmetical commanders, who are always counting heads, but dashed at a superior force with a sublime confidence which in itself was victory! No man will ever become a successful commander unless he despises the science of odds. To achieve great things one must dare great risks.

20. The Impérieuse was ordered home in February 1807, and Cochrane, desirous of ventilating the gross abuses which had crept into the administration of the navy, resolved upon entering Parliament as the representative of some influential borough. He accordingly ventured to contest Westminster against a candidate of such celebrity as Richard Brinsley Sheridan, but avowing himself the zealous friend of reform, and the determined enemy of

corruption, was triumphantly returned. For Westminster he sat as member during many eventful years.

Cochrane in Parliament resembled no one so much as Cochrane at sea! He carried into debate the same sangfroid, readiness, dash, and yet prudence which characterized him in action, and he laid himself alongside of an abuse as he did of a French frigate. No half measures satisfied him; no lukewarm speeches. He denounced corruption and incapacity with fearless candour, so that both the Ministry and the Admiralty were glad to rid themselves of a man so postilently honest by recommissioning the Impérieuse, and ordering her to reinforce Lord Collingwood's fleet in the Mediterranean. She joined that illustrious admiral on November 19, off Toulon, and Collingwood having a high opinion of her captain's zeal and success, despatched her on a cruise in the Archipelago. Ships and batteries again fell before the heroes of the Impérieuse, until Cochrane's name was seldom mentioned by French tongues without an imprecation accompanying it!

21. War between France and Spain having broken out in June 1808, the Impérieuse was ordered by Lord Collingwood to cruise in the Mediterranean, and render the Spaniards what assistance she could. Accompanied by one of her prizes, which had been fitted out as a gunboat, and manned with twenty men, under the command of a lieutenant, she proceeded on her voyage, to encounter incidents so extraordinary, that were they not confirmed by the statements of sober historians, one would be inclined to regard them as the colouring of a Quixotic romance! One of the most extraordinary of these was the defence of the castle of Trinidad against a far superior French force of infantry and artillery.

22. The French had laid siege to Rosas, which the Spaniards gallantly defended, and the Impérieuse proceeded to render them assistance. On November 20, she anchored about ten miles from the fortress. A heavy cannonade was at this time going on between a French battery, which had been thrown up on the cliff above Fort Trinidad, and the English ships previously despatched by

Lord Collingwood to the succour of the Spaniards. Previous to the arrival of the Impérieuse, the marines of the Excellent, together with some Spanish troops, had occupied the citadel. Many of these having been wounded, Captain West took upwards of 40 on board, and withdrew some 30 marines, who, with 60 or 70 Spaniards, had held possession of Fort Trinidad. He then sailed for Gibraltar, leaving the Fame to watch the further proceedings of the enemy. Previous to this event, however, he had laboured energetically to put the citadel, which was half dismantled, in a defensive condition. Against Fort Trinidad and the citadel the French, about 6,000 in number, were now directing the most vigorous operations.

23. Cochrane immediately determined to reinforce the small garrison of Fort Trinidad with some marines from the Impérieuse, and, as he was known to be acting under discretionary orders from Lord Collingwood, Capt. Burnett, of the Fame, though senior officer, did not offer any opposition. Before daylight, on the 24th, he accordingly landed 50 men, ordering all the marines to follow after sunset, and proceeded to strengthen his stronghold by every means

which his ingenuity could suggest.

24. The castle of Trinidad, as it was somewhat magniloquently called, stood on the side of a hill which sloped easily to the sea, but this hill was commanded by a higher and more precipitous cliff, which would have enabled the enemy to drive out the garrison of the fortress with facility, but for certain peculiarities of construction. Thus: Next to the sea stood a fort, whose stout and massive walls were 50 feet in height. In its rear, and connected with it, rose another fort to the height of 80 feet or more, and behind this soared a tower to a still greater altitude of 20 or 30 feet, the whole presenting the likeness of a large church, with a tower 110 feet high, a nave 90 feet high, and a chancel 50 feet. The tower, having its back to the cliff, as a matter of course sheltered the middle and lower portions of the fortress from the fire of the battery above it. Nothing, in short, for a fortress commanded by adjacent heights, could have been better adapted for holding out against offensive operations, or worse adapted for replying to them. 'This, on our part,'writes Lord Cochrane, 'being out of the question, as the French battery was too much elevated on the cliff for artillery to reach, whilst the tower which prevented their shot from annoying us would also have prevented our firing at them, even had we possessed artillery.'

25. It was to this tower,' writes Lord Cochrane, 'that the French chiefly directed their attention,' as a practicable breach therein, followed by a successful assault, would, in their estimation, place the fortress at their mercy, so that we must either be driven out or forced to surrender. In consequence of the elevated position of the enemy's battery on the cliff, they could, however, only breach the central portion of the tower, the lowest part of the breach being nearly 60 feet above its base, so that, when practicable, it could only be reached by long scaling ladders.

'It so happened, that just at the spot where the breach was in process of formation, there was a lofty bomb-proof interior arch, upwards of 50 feet in height. This arch, reaching from the lower part of the breach to the interior base of the tower, was without much difficulty converted into an obstacle, of which the French little dreamed, viz. into a chasm, down which they must have plunged headlong had they attempted to penetrate an inch beyond the outer

wall, even after they had gained it.

26. 'The only operation necessary was to break in the crown of the arch, so that all who on an assault ventured on penetrating farther than the outer wall of the breach, must of necessity be hurled to the bottom. But as the fall of a portion of the enemy might not deter the rest from holding possession of the outer wall till they were provided with the means of overcoming the obstacle, I got together all the timber at hand, and constructed a huge wooden case, exactly resembling the hopper of a mill, the upper part being kept well greased with cooks' slush from the Impérieuse, so that to retain a hold upon it was impossible. Down this, with the slightest pressure from behind, the storming party must have fallen to a depth of 50 feet, and

all they could have done, if not killed, would have been to remain prisoners at the bottom of the bomb-proof.'

The operations of the besiegers, however, were continued with increased energy, and it became evident that sooner or later they would effect a practicable breach.

27. Meanwhile, at midnight on the 27th, the French troops made a general assault upon the town of Rosas, and, after several hours' hard fighting, carried it. Invigorated by this success, they redoubled their efforts against the castle, but were still repulsed by the indomitable courage of Cochrane and his followers. They then sent in a flag of truce, and offered honourable terms of capitulation, but Cochrane was of opinion he had not yet harassed them sufficiently, and refused absolutely to surrender. Five different batteries were now opened by the exasperated enemy, but did little damage—the men lying close—though the fire from the English ships and bombs was by no means of so harmless a character. All access, however, to the citadel was cut off by batteries which the French erected on both sides of the sea-gates.

28. 'The dawn of the 20th,' says Lord Dundonald, in his autobiography, 'might have been our last, but from the interposition of what some persons may call presentiment. Long before daylight I was awoke with an impression that the enemy were in possession of the castle, though the stillness which prevailed showed this to be a delusion. Still, I could not recompose myself to sleep, and after lying for some time tossing about, I left my couch, and hastily went on the esplanade of the fortress. All was perfectly still, and I felt half-ashamed of having given way to such

fancies.

'A loaded mortar, however, stood before me, pointed, during the day, in such a direction that the shell should fall on the path over the hill which the French must necessarily take whenever they might make an attempt to storm. Without other object than that of diverting my mind from the unpleasant feeling which had taken possession of it, I fired the mortar. Before the echo had died away, a volley of musketry from the advancing column of the enemy

showed that the shell had fallen amongst them, just as they were on the point of storming.

Rushing on, their bullets pattered like hail on the walls of the fort. To man these was the work of a moment; for, as may be supposed, our fellows did not wait for another summons, and the first things, barely discernible amidst the darkness, were the French scaling-ladders, ready to be placed at the foot of the breach, with an attendant body of troops waiting to ascend, but hesitating, as though the unexpected shell from our mortar rendered them uncertain as to our preparations for defence. To the purposeless discharge of that piece of ordnance we owed our safety, for otherwise they would have been upon us before we even suspected their presence; and so exasperated were they at our obstinate defence, that very little attention would have been paid to our demand for quarter.

'Whilst the enemy were hesitating, we became better prepared, our men being ready at every point which commanded the breach. It was not in the nature of the French to shirk off on being detected. In a few minutes, on they came up the ladders, to the certainty of getting either into the man-trap or of being hurled from the walls as fast as they came up, retreat being for a short time impossible, on account of the pressure from behind. There was now just light enough for them to see the chasm before them, and the wall was crowded with hesitating men. About 40 had gained the summit of the breach, all of whom were swept off with our fire; whilst a crowd was waiting below for the chance of sharing the same fate. Giving them no time for deliberation, several shells, which had been suspended by ropes half-way down the wall, were ignited, our handgrenades were got to work, and these, together with the musketry, told fearfully on the mass, which wavered for a few moments, and then retreated, amidst the loud huzzas of our fellows. The French, however, gallantly carried off their wounded, though they were compelled to leave the dead, who, till the following morning, lay in a heap close to the foot of the tower.'

29. But the citadel, garrisoned by the Spanish, having

surrendered, Lord Cochrane determined to evacuate the castle, which had now become untenable, having first made preparations for blowing it up. On December 5, these operations were successfully effected, and the gallant English sea-king embarked his men on board the Impérieuse, leaving to the French the melancholy satisfaction of hoisting their flag on the ruins of the fortress they had so obstinately

besieged.

30. A still more notable instance of the steady resolution with which our illustrious hero pursued a special object is the share which he had in the destruction of the French fleet in the Basque Roads. Eight sail of the line and two frigates were there blockaded by an English fleet of greater force, under Admiral Lord Gambier, but from the formidable nature of the shore batteries which defended them, and the difficult character of the channel which opened into the roads, and was completely unknown to the English pilots, Lord Gambier pronounced an attack upon them as 'hazardous, if not desperate.' The British Admiralty, however, in some apprehension lest the French should slip out, unperceived, and proceed to harass our West India colonies, were desirous that an attack should be made, and, looking upon Lord Cochrane as a man not easily dismayed by obstacles, called him to their assistance, and invited him to undertake the enterprise. Lord Cochrane pointed out how invidious it would be for him to enter upon an attempt whose desperate nature had been so openly characterised by Lord Gambier and his principal officers; but his objections were overruled by the Admiralty, and an appeal being made to the earnestness of his patriotism, he consented. The mode of operation he considered desirable to adopt was warmly approved of, and he was despatched to the scene of action with full powers to superintend its execution.

31. The Imperieuse arrived in Basque Roads on April 3, 1809, and from that day Lord Cochrane's difficulties commenced. Lord Gambier himself behaved with urbanity. Unfortunately, though a gallant sailor, he was an indifferent chief, for he lacked that one quality without which there never was a great general—decision. The flag-officence

under him, however, regarded Lord Cochrane with illconcealed aversion as an interloper arrived to demonstrate,
most inconveniently, how feasible was the attack which had
formerly appeared to them impracticable. Every captain
was his senior, and his selection, therefore, to conduct the
enterprise—of which, nevertheless, the plans were his own
—was regarded as a personal indignity. As Lord Cochrane
himself said, he had thrust his head into a hornet's nest!

32. The French fleet in the Basque Roads was thus arranged:—ten sail of the line were formed in two ranks. nearly north and south, under the protection of the batteries on the Isle of Aix, which lay about a mile distant. advance of these lay four frigates, and in front of the whole a boom of the most extraordinary dimensions. Lord Cochrane's plan contemplated the destruction of this boom by means of explosion-vessels of a novel character, and the employment of fire-ships to harass the enemy's fleet, while the English men-of-war bore up, and engaged in the work of destruction. The explosion-vessel was, indeed, a new and terrible engine of warfare. Its floor was rendered as firm as possible by means of logs placed in close contact, into every crevice of which other substances were firmly wedged, so as to afford the greatest possible amount of resistance to the explosion, and thus to increase its force. Upon this basis was placed a large number of spirit and water-casks, into which 1,500 barrels of powder had been emptied. These casks, when set upright and bound round with hempen cables, resembled a monstrous mortar, and the explosion would necessarily mount upwards with terrible effect. Over the powder casks were piled several hundred shells, and over these again nearly three hundred hand-grenades; the whole compressed, by means of wedges and sand, into a tolerably solid mass.

33. These explosion-ships were simply 'naval mines,' and depended for their effect quite as much 'on their novelty as engines of war, as upon their destructiveness. It was calculated that, independently of any mischief they might do, they would cause such an amount of terror, as to 'nduce the enemy to run their ships ashore as the only way

to avoid them and save the crews.' In this they succeeded, and that the whole of the French fleet was not utterly destroyed, was owing to the incapacity of Lord Gambier and the lukewarmness of his subordinates.

34. Having at length obtained the admiral's permission to make an attack, Lord Cochrane, after nightfall, on the 11th of April, embarked on board the largest explosion-vessel, accompanied by Lieutenant Bisset and a volunteer crew of four men only, and proceeded on his perilous The Impérieuse, and the frigates Pallas, Unicorn, and Aigle were anchored in a convenient position to receive

the crews of the fire-ships when they returned.

'The night was dark,' writes the gallant hero, 'and as the wind was fair, though blowing hard, we soon neared the estimated position of the advanced French ships, for it was too dark to discern them. Judging our distance, therefore, as well as we could, with regard to the time the fuse was calculated to burn, the crew of four men entered the gig, under the direction of Lieutenant Bisset, whilst I kindled the port-fires; and then, descending into the boat, urged the men to pull for their lives, which they did with a will, though, as wind and sea were strong against us, without making the progress calculated.

'To our consternation, the fuses, which had been constructed to burn fifteen minutes, lasted little more than half that time, when the vessel blew up, filling the air with shells, grenades, and rockets; whilst the downward and lateral force of the explosion raised a solitary mountain of water, from the breaking of which in all directions our little boat narrowly escaped being swamped. respect it was, perhaps, fortunate for us that the fuses did not burn the time calculated, as, from the little way we had made against the strong head wind and tide, the rockets and shells from the exploded vessel went over us. Had we been in the line of their descent, at the moment of explosion, our destruction, from the shower of broken shells and other missiles, would have been inevitable.

'The explosion-vessel did her work well, the effect constituting one of the grandest artificial spectacles imaginable. For a moment the sky was red with the lurid glare arising from the simultaneous ignition of 1.500 barrels of powder. On this gigantic flash subsiding, the air seemed alive with shells, grenades, rockets, and masses of timber, the wreck of the shattered vessel; whilst the water was strewn with spars, shaken out of the enormous boom on which the vessel had brought up before she exploded. The sea was convulsed as by an earthquake, rising, as has been said, in a huge wave, on whose crest our boat was lifted like a cork, and as suddenly dropped into a vast trough, out of which, as it closed upon us with a rush of a whirlpool, none expected to emerge. The skill of the boat's crew, however, overcame the threatened danger, which passed away as suddenly as it had arisen, and in a few minutes nothing but a heavy rolling sea had to be encountered, all having again become silence and darkness.

'This danger surmounted, we pulled in the direction of the Impérieuse, whose lights could be distinguished at about three miles' distance. On our way we had the satisfaction of seeing two fire-ships pass over the spot where the boom had been moored. Shortly afterwards we met the Mediator steering in the direction of the enemy, whose ships of the line were now firing towards the spot where the explosion had taken place, and consequently on their own advanced frigates! which, as was afterwards learned, cut their cables, and shifted their berths to a position in the rear of the larger ships.'

85. Of the twenty fire-ships employed, so great was the mismanagement, that only four reached the enemy's position, and not one did any injury. Nevertheless, such was the terror excited among the French by the explosion-vessel, that most of their ships cut their cables and, with the exception of two, drifted helplessly ashore. In this position they might easily have been destroyed if Lord Gambier would have sent in his fleet, or a part of it, to complete the work which Cochrane had so well begun. But, to Cochrane's intense mortification, he made no sign. At daybreak, on the 12th, the hero-captain of the Impérieuse endeavoured to arouse his superior to a sense of his duty by signalling,

'All the enemy's ships, except two, are on shore.' The only response from the admiral was the answering pennant. Resolute to effect his object, Cochrane now announced, 'The enemy's ships can be destroyed.' Again the answering pennant. 'Half the fleet can destroy the enemy.' A third time the answering pennant. Wroth at such cool neglect, Cochrane boldly made signal, 'The frigates alone can destroy the enemy,' but his audacity met with no other reply than the answering pennant. Observing that the French had somewhat recovered from their consternation, Cochrane now signalled, 'The enemy is preparing to heave off,' and not doubting but that Lord Gambier would interfere to prevent such a catastrophe, he dropped anchor close to the Boyart Shoal, in readiness for any service that might be required.

86. At 11 o'clock the British fleet actually weighed. and, to Lord Cochrane's intense delight, stood towards Aix Roads. By this time two or three of the French vessels were heaving off with the view of escaping into the river Charente, but there was still room for much to be accomplished. Consider, then, the mortification, not of Lord Cochrane alone, but of every gallant heart on board the fleet, when the British ships again came to anchor about three miles and a half out of range. The captain of the Impérieuse now resolved on forcing Lord Gambier into action by attacking the enemy singly, and, at 1 P.M., ordering the anchor to be 'hove a-trip,' drifted stern foremost towards the foe. Thus the Impérieuse passed uninjured the batteries of Aix, and then suddenly making sail in pursuit of the nearest of the enemy's vessels, signalled, 'Enemy superior to chasing ship, but inferior to the fleet.' No attention being paid to this intimation, Lord Cochrane, a few minutes later, made signal, 'In want of assistance'which was not an exaggeration, inasmuch as he was then engaging three line-of-battle ships—and thus compelled Lord Gambier to detach several vessels to his support, unless prepared to incur the reproach of having abandoned a British frigate to the enemy.

37. The result of Cochrane's determination was the

destruction of four of the French line-of-battle ships, though had his noble example inspired his admiral with a spirit equal to his own, and a like contempt of obstacles, every one of the enemy's vessels must have perished.

Into the recriminations in parliament and the acrimonious courts-martial which ensued, and which acquitted Lord Gambier though public opinion severely condemned him, it is not our province to enter. We have shown that of the success obtained, partial as it was, Lord Cochrane's resolute persistence was the cause—another encouragement to the young to dare nobly, and to concentrate every faculty on the accomplishment of the object they have set before themselves.

38. What might have been effected had Cochrane filled the place so unworthily occupied by Lord Gambier, has been stated by an unimpeachable authority—the imperial master of the French fleet—Napoleon himself.

'Some conversation,' says Mr. O'Meara, 'now took place about Lord Cochrane, and the attempt which his Lordship had made to capture or destroy the ships in the Charente.

'I said it was the opinion of a very distinguished officer, whom I named, and who was well known to him, that if Cochrane had been properly supported, he would have

destroyed the whole of the French ships.

"He would not only have destroyed them," replied Napoleon, "but he might and would have taken them out, had your admiral supported him as he ought to have done. For in consequence of the signal made by L'Allemand (the French admiral) to the ships to do the best in their power to save themselves—sauve qui peut, in fact—they became panic-struck, and cut their cables. The terror of the brûlots was so great, that they actually threw their powder overboard, so they could have offered very little resistance."

"The French admiral," continued Napoleon, "was an imbecile, but yours was just as bad. I assure you, that if Cochrane had been supported, he would have taken every one of the ships. They ought not to have been alarmed by your brâlots, but fear deprived them of their senses, and they no longer knew how to act in their own defence."

89. With the remainder of the gallant sailor's career—his unjust persecution, his brilliant services in the Chilian War of Independence, his tardy restoration to his deserved honours, and the official recognition of his innocence of any crimes but that of an ardent zeal for his country's glory—it is not necessary for us to concern ourselves. We have selected those incidents in his eventful life which most signally illustrate the fact, that success always attends the perseverant efforts of a man of resolution and fixity of purpose, even if the incapacity or opposition of others tend in some measure to confine it within partial limits. It is only necessary to add that the Earl of Dundonald died, full of years and honours, in 1862

WILLIAM DAMPIER.

1. It would be difficult to find among the sea-heroes of England a more notable example of genius subduing difficulties and rising superior to circumstances than is afforded by William Dampier, the Buccaneer. Throughout his eventful life his great aim was knowledge; knowledge was his overmastering passion; to see, to observe, to learn the manners of men and the characteristics of strange countries; and what he observed and learned to treasure up for the information of his fellows. Under what perilous circumstances, and under what severe discouragements, he steadily and successfully carried out his cherished design, we proceed, very briefly, to indicate.

2. William Dampier was born at East Coker, near Yeovil, in 1652. His father leased and cultivated a small farm, whose scanty yield just sufficed for the maintenance of his family, and he contrived during his lifetime to afford his son the rudiments of a liberal education. After his death he was placed with a Weymouth shipmaster, but had already so well made use of the limited opportunities which had fallen to him that, as it has been justly remarked, he may be accepted as another proof that 'the best part of a

man's learning is what he acquires by himself.'

3. His early inclination induced him to adopt a seafaring

- life. At first he sailed only as far as the French coast. Next he visited Newfoundland, suffering severely from the weather; and thirdly, went upon 'a long and warm voyage' to Bantam. In this last adventure he began that record of his experiences, his Journal, which is, perhaps, the most interesting contribution to English literature ever made by a sailor. On his return to England he entered the Royal Navy, and was engaged in two great sea-fights with the Dutch, but overcome by ill-health was constrained to quit the service, and retire to his brother's house until he became convalescent.
- 4. He now undertook a voyage to Jamaica, with the view of accepting there the under-overseership of a plantation belonging to a Colonel Hellier, and partly, perhaps, to gratify his longing for 'fresh scenes and pastures new.' But he soon grew discontented with the monotony of his lot, and his naturally humane disposition revolted from the guardianship of wretched slaves. Quick to observe, and felicitously accurate in noting the results of his observation. he once more embraced a nautical life, engaging himself on board of one of the trading ships which coasted round Jamaica. Next he became a logwood cutter in the Bay of Campeachy, patiently enduring the severest hardships, and suffering no natural curiosity to pass unnoticed. Here is a specimen of his minuteness of observation: 'The wild pine, he says, is a plant so called because it somewhat resembles the bush that bears the pine; they are commonly supported, or grow from some bunch, knot, or excrescence of the tree, where they take root and grow The root is short and thick, from whence the leaves rise up in folds one within another, spreading off at the top. They are of a good thick substance, and about ten or twelve inches long. The outside leaves are so compact as to contain the rain-water as it falls. They will hold a pint and a half, or a quart; and this water refreshes the leaves and nourishes the roots. When we find these pines, we stick our knives into the leaves just above the root, and that lets out the water, which we catch in our hats, as I have done many times to my great relief.'

- 5. After a brief but tedious experience of logwood cutting, Dampier turned to buffalo-hunting, and joined three Scotch adventurers in the preparation and sale of buffaloskins. It would appear that in no long time he earned sufficient gains to enable him to return to England in August 1670, to make a respectable marriage, and enjoy a few months of peaceful retirement. He again visited Jamaica in 1679, acquired money enough for the purchase of a small Dorsetshire estate, and was about to sail for England to settle upon it, when a Mr. Hobby prevailed upon him to join a trading voyage to the Mosquito shore, which promised a safe and satisfactory return. On their voyage they put with their vessel into a small bay on the western coast of the island, where they lighted upon certain well-known sea-rovers, or 'buccaneers,' as Dampier calls them—Captains Sharp, Sawkin, and Coxon—who soon induced the crew, and finally Dampier himself, to enlist under their adventurous flags. In coming to this determination our seaman appears to have been almost wholly influenced by his passionate love of knowledge, which no 'moving accidents by flood or field' could weaken.
- 6. Our design will not permit us to dwell upon the strange adventures through which Dampier passed uninjured. He visited many lands, and made acquaintance with many peoples, recording all that attracted his attention in language felicitously simple, and with an admirable minuteness of detail. Thus, speaking of the Mosquito men, who were faithful auxiliaries of the buccaneers, he says:-'They have extraordinary good eyes, and will descry a sail at sea, and see anything better than we. Their chiefest employment in their own country is to strike fish, turtle, or They are tall, well-made, raw-boned, lusty, manatee. strong, and nimble of foot, long visaged, lank black hair, look stern, hard favoured, and of a dark copper complexion. They behave themselves very bold in fight, and never seem to flinch nor hang back; for they think that the white men with whom they are know better than they do when it is best to fight; and, let the disadvantage of their party be never so great, they will never yield nor give back while

any of their party stand. They delight to settle near the sea, or by some river, for the sake of striking fish, their beloved employment; for within land there are other Indians, with whom they are always at war. After the man hath cleared a spot of land, and hath planted it, he seldom minds it afterwards, but leaves the managing of it to his wife, and he goes out a striking. Sometimes he seeks only for fish, at other times for turtle or manatee, and whatever he gets he brings home to his wife, and never When hunger stirs out to seek for more till it is eaten. begins to bite, he either takes his canoe and seeks for more game at sea, or walks out into the woods and hunts for pecaree and waree, each a sort of wild hogs, or deer, and seldom returns empty-handed, nor seeks any more as long as it lasts. Their plantations have not above twenty or thirty plantain trees, a bed of yams and potatoes, a bush of puninto, and a small spot of pine apples, from which they make a sort of drink, to which they invite each other to be merry.'

7. In the course of their adventures the buccaneers visited the pleasant island of Juan Fernandez, but departing somewhat hurriedly in pursuit of three Spanish vessels, they left on shore a Mosquito Indian, named William. Three years later, when Dampier was cruising with Captain Cook, he again called at Juan Fernandez, and found the Solitary alive and in good health. The account he gave of his mode of life is interesting. When left on shore he had with him his knife, his gun, and some powder and shot, but having soon expended his ammunition, he converted his knife into a saw, and, cutting the barrel of his gun into pieces, wrought them into harpoons, hooks, lances, and a long blade. First he heated the fragments of iron red hot; then hammered and beat them with a large stone, and sawed them with his jagged knife, or ground them to a tolerable edge. While thus employed he lived upon seals, but was afterwards enabled to refresh himself with goats' flesh and fish. His hut, which he built in a sequestered nook commanding a prospect of the sea, was lined with goat-skins, and his couch, raised above the ground on posts, was similarly

covered. The same material supplied him with clothes. Thus it is evident that Dampier's account of the Island-Solitary suggested several incidents to Defoe for his

fascinating romance of 'Robinson Crusoe.'

8. After having harassed the shores of the Spanish Main with fire and sword, Captain Swan and Dampier sailed as far north as California, and then boldly stretched across the Pacific to cruise among the rich islands of the The good ship Cygnet began this bold Indian seas. adventure on the 31st of March 1686, and day after day, night after night, she sailed onward - 'onward through the golden sunshine, onward through the purple darkness, seeing no living thing, whether fish, or bird, or insect'catching no glimpse of the fair fresh land, its hills, and leas, and valleys, until, after a run of no less than 7,000 miles. she anchored on the west side of Guahan at midnight on the 21st of May. Having obtained provisions she next bore away for Mindanao, and afterwards her restless masters cruised in the Gulf of Siam, visited the Philippines, and steered for New Holland or Australia. Of these places and of their inhabitants Dampier has left a graphic description, whose almost literal accuracy has been abundantly confirmed by later navigators.

9. Dampier had long been weary of the uncongenial society and the lawless life to which he was condemned, and when the Cygnet reached the Nicobar Isles he at last obtained his release. Two of his comrades joined him, and four Malays being also set on shore, the seven adventurers, exchanging an axe with one of the natives for a canoe—'a strong and roomy boat, with a good mast, a sail made of mat, and outriggers, which the Malays skilfully contrived'—collected a supply of water, bread-fruit, and cocoa-nuts, and put out to sea. Dampier fortunately had in his possession a small pocket-compass, and a chart of the Indian seas roughly outlined in his pocket-book.

They had not been out more than three days when a terrible storm arose, and exposed them to perils which may best be described in Dampier's own perspicuous lan-

guage: -

"It was the morning of the 18th of May 1688, and the wind bearing very hard, we rolled up the foot of our sail on a pole fastened to it, and settled our yard within three feet of the canoe's side, so that we had now but a small sail; yet it was still too big, considering the wind; for the wind being on our broadside, pressed her down very much, though supported by her outlayers; insomuch that the poles of the outlayers going from the sides of the vessel bent as if they would break; and should they have broken, our overturning and perishing had been inevitable. sides, the sea increasing would soon have filled the vessel this way. Yet thus we made a shift to bear up, with the side of the vessel against the wind, for awhile; but the wind still increasing, about 1 o'clock in the afternoon we put away right before wind and sea, continuing to run thus all the afternoon and part of the night ensuing. The wind continued increasing all the afternoon, and the sea still swelled higher and often broke, but did us no damage; for the ends of the vessel being very narrow, he that steered received and broke the sea on his back, and so kept it from coming in, which we were forced to keep heaving out continually. The evening of this day was very dismal. sky looked very black, being covered with dark clouds. The wind blew hard, and the seas ran high. The sea was already roaring in a white foam about us; a dark night coming on, no land to shelter us, and our little bark in danger to be swallowed by every wave; and, what was worst of all, none of us thought ourselves prepared for another world. I had been in many imminent dangers before now, but the worst of them all was but playgame in comparison with this. I had long before this repented me of that roving course of life, but never with such concern as now. I did also call to mind the many miraculous acts of God's providence towards me in the whole course of my life, of which kind few men, I believe, have met the like. And for all these I returned thanks in a peculiar manner, and once more desired God's assistance, and composed my mind as well as I could in the hopes of it, and, as the event showed, I was not disappointed of my hopes. Submitting

ourselves, therefore, to God's good providence, and taking all the care we could to preserve our lives, Mr. Hall and I took turns to steer, and the rest to heave out the water; and thus we provided to spend the most doleful night I ever was in. About 10 o'clock it began to thunder, lighten, and rain; but the rain was very welcome to us, having drank

up all the water we brought from the island.

'The wind, at first, blew harder than before, but within half-an-hour it abated and became more moderate, and the sea also assuaged of its fury; and thus by a lighted match, of which we kept a piece burning on purpose, we looked on our compass to see how we steered, and found our course to be still east. We had no occasion to look on the compass before, for we steered right before the wind; which, if it shifted, we had been obliged to alter our course accordingly. But now, it being abated, we found our vessel lively enough with that small sail, which was then aboard, to haul to our former course, in hopes again to get to the island of Sumatra.'

10. They reached Sumatra in safety, but so severe had been their sufferings that a long interval of enforced rest was needful for their recovery. Then Dampier, still warm with a restless fire, visited Tonquin—of which he has left a most interesting description—Malacca, Fort St. George, and Bencoolen; his spirit yearning in constant desire,

To follow knowledge, like a sinking star, Beyond the utmost bound of human thought.

He returned to England in September 1691, a poorer man than he had left it, except in knowledge and experience, but his fortunes were much improved in the following year by the publication of his 'New Voyage round the World,' which immediately seized the attention of the public; it was translated into French and Dutch. The lucidity of his style, the vigour of his descriptions, and the force and truth of his narrative were generally recognised, and to the fame of a skilful navigator he now added that of an admirable writer.

11. In 1699 Dampier was selected to command an

expedition of discovery on the coasts of New Holland and New Guinea, designed by William III., but the vessel placed under his command was utterly unfit for so difficult a service. He discovered the channel which separates New Guinea from New Britain, and various islands grouped in the Australian seas. On his homeward voyage his shattered ship leaked so terribly that he was compelled to run her ashore on the Island of Ascension to save the lives of his crew. They were taken off by some passing vessels, and reached England in safety in April 1701. The loss of his ship, though resulting from no want of caution or skill on Dampier's part, seriously affected his reputation; and he complained, in a preface to his 'Voyage to New Holland,' that 'the world is apt to judge of everything by success, insomuch that whoever has ill-fortune will hardly be allowed a good name.

11. He could not, however, have long remained in the shadow of disgrace for in April 1704, Captain William Dampier sailed on a privateering expedition against the Spanish possessions in the West Indies. It was unattended with successful results, and he returned to England in 1707. In the following year he acted as pilot in Captain Woodes Rogers' expedition to the South Seas, which so successfully attacked Guayaquil, captured the Manilla treasure-ship, and returned to England in 1711, with plunder valued at 150,000l. Henceforth we hear no more of this intrepid and unresting searcher after knowledge; the date and place of his death are both unknown; and 'no memorial or tradition remains of him in whose remarkable life the adventures of Selkirk. Wafer, and the buccaneer commanders of the South Sea appear but as episodes. Judged by the world's standard, Dampier was an unsuccessful man, but at least he succeeded in obtaining that wide and varied knowledge for which his desire was so all-mastering, and accomplished that pure and noble object to which he devoted a long and eventful life.

ROBERT, LORD CLIVE.

1. Though there was so much of true greatness in the character and genius of Clive, we cannot set him before our readers as a model to be imitated. Nevertheless, his career is a remarkable illustration of the fortune which attends the man of unwavering purpose and steadfast will. 'Clive's ruling passion,' says Mr. Gleig, 'was ambition. He never won a step in the ladder of fame or of social position without immediately seeking to rise beyond it. Being Governor of Bengal, he desired his father to ascertain, by enquiring among his friends, whether or not it might be practicable to obtain an appointment as Governor-General of British When satisfied that the time was not yet come for such an arrangement, he avowed his determination, as soon as he should return home, to obtain a seat in the House of Commons, and to go with the ministry.' It was by so absolute a concentration of thought, passion, will, and mental power upon one steady unchanging aim, that the country attorney's son rose to a peerage, founded an empire, and won an imperishable renown.

2. Robert Clive, the son of Richard Clive, a Shropshire attorney, was born in the manor-house of Styche, on September 29, 1725. When scarcely three years old, he went to reside with a Mr. Bayley, one of his uncles-in-law, of Hope Hall, near Manchester, who behaved to him with great kindness, though at a very early age his impetuosity of temper and force of character made themselves disagreeably evident. 'Fighting,' says Mr. Bayley, writing of him when seven years old, 'to which he is out of measure addicted, gives his temper such a fierceness and imperiousness, that he flies out upon every trifling occasion.' He changed from school to school with remarkable rapidity. From Lostock, when eleven years old, he went to Market Drayton; thence to the Merchant Taylors' School at London, and, finally, to a private academy in Hemel Hempstead; everywhere displaying a wonderful intrepidity, and a courage that verged upon rashness. It is told of him, at Market

Drayton, that he climbed to the top of its lofty churchsteeple, and seated himself on a stone water-spout near its summit; that he formed all the idle lads of the town into a predatory band, who levied a species of black-mail upon the tradespeople; and that once, when endeavouring to turn a dirty watercourse into the shop of an obnoxious townsman, the turf dam breaking down which his companions had erected, he threw himself into the gutter, and supplied the breach with his body until the damage could be repaired.

3. Clive's evident distaste to his father's profession induced his parents gladly to accept for him, when he was in his eighteenth year, a writership in the service of the East India Company, and, as both his friends and relatives agreed in regarding him as a headstrong dunce, he was shipped off, without much concern, to find a fortune or a grave at Madras. British power in India was then in the throes and trials of its infancy, and the East India Company was but a mere trading corporation, owning a few square miles of territory, protected by three or four ill-constructed forts and a few hundreds of European and native troops. The surrounding country was ruled by the Nabob of the Carnatic, a deputy of the Viceroy of the Deccan, commonly called the Nizam, who in his turn was the deputy or lieutenant of the august sovereign whom our forefathers styled the Great Mogul.

During his long and tedious voyage to Madras, Clive acquired some knowledge of the Portuguese tongue, and expended the little store of pocket-money with which he had been provided. His situation, therefore, when he arrived at Madras was a peculiarly painful one. He had neither money nor friends. His pay was small, and he had contracted debts. His reserved and haughty disposition kept at a distance all offers of assistance. He suffered from the climate, and scarcely less from the uncongenial character of his duties. His only resource was the governor's library, of which he was permitted freely to avail himself. But neither climate nor poverty,' says Macaulay, 'neither duty nor the sorrows of a home-sick exile, could tame the

sperate audacity of his spirit. He behaved to his official

superiors as he had behaved to his schoolmasters, and was several times in danger of losing his situation. Twice, while residing in the Writer's Buildings, he attempted to destroy himself; and twice the pistol which he snapped at his own head failed to go off. This circumstance, it is said, affected him as a similar escape affected Wallenstein. After satisfying himself that the pistol was really well loaded, he burst forth into an exclamation that surely he was reserved for something great.'

4. At this time an event occurred—the capture of Madras by the French, under the ambitious Dupleix, Governor of Pondicherry—which seemed calculated to destroy all his rising hopes of greatness, and yet eventually proved the stepping-stone to a great and illustrious career. Clive fled from the town by night, disguised as a Mussulman, and took refuge at Fort St. David, one of the small English settlements dependent upon Madras. Throwing off his civilian bondage, he sought and obtained permission to enter a service better adapted to his genius and disposition; and at twenty-one commenced his military career as an ensign. His fearless contempt of danger, his resolution, promptitude, felicity of judgement, and foresight, soon distinguished him above his fellow-officers, and attracted the attention and admiration of his superior, himself a man of courage and ability, Major Lawrence. The disputes which arose between the rival French and English companies—disputes originating in a contention for territorial influence, and terminating in a war for the possession of supreme power in India—opened up to the young adventurer dazzling prospects of distinction. The French had made one Mirzapha Jung Viceroy of the Deccan, and ruled in his name with exultant ostentation. Chunda Sahib owed to their arms the nabobship of the Carnatic, and everywhere the triumph of their policy seemed complete. Dupleix was declared Governor of India from the river Kristna to Cape Comorin, a tract of country about as large as France; and to perpetuate the memory of his success, he built a city bearing the boastful name of Dupleix Fatihabad, or the City of the Victory of Dupleix, and erected a column whose

four sides bore pompous testimony, in four languages, to

the glory of the French.

Meanwhile, the English had recognised Mahomed Ali as Nabob of the Carnatic, but Chunda Sahib and his French auxiliaries having shut him up in Trichinopoly, it seemed impossible, with the small English force at hand, to raise the siege. The natives looked with scorn on the mighty nation which was soon to conquer and rule them. Everywhere they saw the evidences of French power, and everywhere the successes of the French arms. Of the English, they only knew that their principal settlement had been captured, and their chiefs led in triumph through the streets of Pondicherry. It was reserved for Clive to raise from the dust the honour of the English name.

5. Clive was now twenty-five years old, and after hesitating for some time between a civilian and a military life, had at length settled in a position which united both characters—that of commissary to the troops, with the rank of captain. His political sagacity discerned the perils of the situation, and he pointed out to his superiors that now or never must the encroachments of French power be resisted. He proposed, by a sudden attack on Arcot, the capital of the Carnatic, to force the French to raise the siege of Trichinopoly. The English authorities, alive to the dangers which threatened them, adopted Clive's project, and entrusted him with its execution. He was placed at the head of 200 English soldiers and 300 sepoys, armed and disciplined after the European fashion, and with eight officers, only two of whom had ever before been in action, pushed forward, through a terrible storm of thunder, lightning, and rain, to the gates of Arcot. Their unexpected appearance produced a panic. It was as if armed men had suddenly sprung from the bowels of the earth. The garrison fled from the fort, and the English entered it without striking a blow.

But if he had gained it without a struggle, Clive knew he should not be left to hold it unmolested. He made immediate preparations, therefore, to withstand a siege. He sent to Madras for a couple of 18-pounders, and finding eight cannon of different calibres in the place, he mounted them in the most commanding positions. A store of provisions was laid in, and the confidence of the inhabitants secured by a firm discipline and equitable rule. Then, ascertaining that the fugitive garrison, recovered from its surprise, was encamped near Fort Tuniry, six miles from Arcot, he sallied out on the 4th of September to attack them. As soon as Clive's men approached within gunshot, the enemy took to flight, and a sharp pursuit being ordered, they suffered severely. Clive returned to Arcot without losing a single man.

When Chunda Sahib was apprised of these events, he detached 4,000 men from his camp before Trichinopoly, who, with 2,000 men from Vellore, 150 French soldiers from Pondicherry, and the remains of the former garrison of Arcot, in all 10,000 men, were placed under the command of his son, Rajah Sahib. To resist this overwhelming force Clive was at the head of 120 Europeans and 200 sepoys. The walls of the fort were dilapidated, the ditches dry; the battlements afforded no protection to the soldiers, and the ramparts were too narrow to admit the cannon. Under such circumstances as these Clive won success, for genius is never more happy than when contending with the difficulties which seem insuperable to ordinary minds.

6. 'During fifty days,' says Macaulay, 'the siege went on. During fifty days the young captain maintained the defence, with a firmness, vigilance, and ability which would have done honour to the oldest marshal in Europe. The breach, however, increased day by day. The garrison began to feel the pressure of hunger. Under such circumstances, any troops so scantily provided with officers might have been expected to show signs of insubordination; and the danger was peculiarly great in a force composed of men differing widely from each other in extraction, colour, language, manners, and religion. But the devotion of the little band to its chief surpassed anything that is related of the Tenth Legion of Cæsar, or of the Old Guard of Napoleon. The sepoys came to Clive, not to complain of their scanty fare, but to propose that all the grain should be given to the Europeans, who required more nourishment than the

natives of Asia. The thin gruel, they said, which was strained away from the rice, would suffice for themselves. History contains no more touching instance of military fidelity, or of the influence of a commanding mind.'

At last it was known that a body of 6,000 Mahrattas, under Morari Row, were on their way to Clive's assistance. Rajah Sahib determined to storm the fort. He selected a day well calculated to stimulate to the utmost the spirits of his soldiers; the great Moslem festival which consecrates the memory of Hosein, the chief of the Fatimites. Drugs were employed still further to inflame minds already on fire with religious enthusiasm and wild with bang; mad with fanatical zeal the Moslems rushed to the attack.

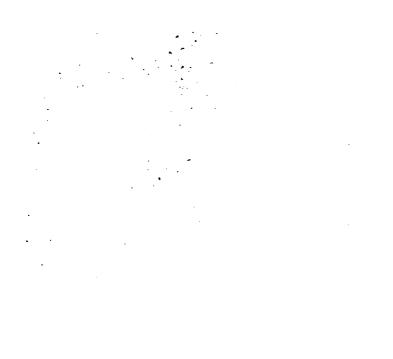
Clive had gained information of the meditated assault. and made the preparations necessary to defeat it. Worn out with fatigue and anxiety he had flung himself on his Aroused by the alarm, he repaired instantly to his The enemy advanced, urging before them elephants whose foreheads were covered with plates of iron, and whose overwhelming force, it was supposed, would break down the gates. But these, irritated by the musketry of the besieged, turned round upon their own people, and trampled them to the ground, as they rushed furiously to the rear. The assailants sought to pass over the ruins that choked up the ditch; they were swept away in scores by the steady fire of the garrison. Where the water was deep they endeavoured to cross on a raft. Clive with his own hand aimed a field-piece, which cleared it in a moment. The rear ranks of the English kept the front ranks constantly supplied with loaded muskets, so that the unceasing fire soon quelled the brief madness of the Moslem host, and at length they retreated, leaving behind them no fewer than 400 dead.

On the following morning, a patrol sent to watch the enemy's movements, reported that he was nowhere to be seen. He had retired, leaving a vast booty of treasure, guns, and military stores to fall into the hands of the English.

7. Success, however signal, could not lull Clive's active



WHAT CLIVE DID AS HIS OWN GUNNER.



genius into repose, and being joined by a reinforcement of 900 troops from Madras, he began offensive operations. He captured the fort of Tuniry, effected a junction with a division of the Mahrattese, and hastened, by forced marches, to attack Rajah Sahib, who was still at the head of a considerable army. He fell upon him suddenly, and utterly routed him. His military chest passed into the hands of the victors; 600 disciplined sepoys deserted from his ranks; and Conjevereau surrendered without a blow. Such were the marvellous achievements of a single campaign.

But the other English officials lacked Clive's energy and enterprise, and conducted matters with so much supineness, that Rajah Sahib again took heart, and gathered together a new army, rendered formidable by the addition of 400 Frenchmen. The damage he inflicted upon the English territories was so considerable that Clive (January 1752) was sent to check him. Though greatly superior in numbers and artillery, the Moslems were indisposed to face Clive's resolution and intrepidity, and it was with difficulty they were forced to give battle at a place called Coverspak. They were justified in their apprehensions by the result, for they were soundly beaten, with a loss of 350 killed, 60 Europeans taken prisoners, and nine pieces of cannon captured. On his return to Fort St. David, the victor devastated the town of Dupleix Fatihabad, and levelled the Frenchman's boastful column to the earth: a piece of sound policy, from the great influence it produced upon the native mind.

8. Encouraged by these successes, the government of Madras determined upon the relief of Trichinopoly. At this juncture Major Lawrence returned from England, and assumed the chief command. Clive was usually impatient of control, but he possessed a nature peculiarly susceptible to kindness, and remembering the generous treatment he had received from Lawrence at the outset of his career, he acted under him with zeal and goodwill. Nor was Lawrence slow in acknowledging the great qualities of his subordinate. 'Some people,' he would say, 'are pleased to term Captain Clive fortunate and lucky; but, in my opinion, from the knowledge I have of the gentleman, he

deserved and might expect from his conduct everything as it fell out;—a man of an undaunted resolution, of a cool temper, and of a presence of mind which never left him in the greatest danger—born a soldier; for, without a military education of any sort, or much conversing with any of the profession, from his judgement and good sense, he led on an army like an experienced officer and a brave soldier, with a prudence that certainly warranted success.'

The two friends were everywhere triumphant. Not only did they relieve Trichinopoly, but besieged the besiegers, and compelled them to surrender. Steadily the power of Britain asserted itself above that of France, and silently and surely were laid the foundations of that mighty empire which is the wonder, and, perhaps, the envy of the world. The end of the French raj drew near, and the star of

England was conspicuously in the ascendant.

9. The climate had by this time so much impaired Clive's constitution, that it became necessary for him to return to England to recruit his strength. Before his departure he undertook and executed a service eminently characteristic of the man. We shall describe it in the graphic language of Lord Macaulay: — 'The forts of Covelong and Chingleput were occupied by French garrisons. It was determined to send a force against them. But the only force available for this purpose was of such a description that no officer but Clive would risk his reputation by commanding it. consisted of 500 newly-levied sepoys, and 200 recruits who had just landed from England, and who were the worst and lowest wretches that the company's crimps could pick up in the flash houses of London. Clive, ill and exhausted as he was, undertook to make an army of this undisciplined rabble, and marched with them to Covelong. A shot from the fort killed one of these extraordinary soldiers; on which all the rest faced about and ran away, and it was with the greatest difficulty that Clive rallied them. On another occasion, the noise of a gun terrified the sentinels so much that one of them was found, some hours later, at the bottom of a well. Clive gradually accustomed them to danger, and, by exposing himself constantly in the most perilous

situations, shamed them into courage. He at length succeeded in forming a respectable force out of his unpromising materials. Covelong fell. Clive learned that a strong detachment was marching to relieve it from Chingleput. He took measures to prevent the enemy from learning that they were too late, laid an ambuscade for them on the road, killed 100 of them with one fire, took 300 prisoners, pursued the fugitives to the gates of Chingleput, laid siege instantly to that fastness, reputed one of the strongest in India, made a breach, and was on the point of storming, when the French commandant capitulated and retired with his men.'

Clive now returned to Madras, married a Miss Maskelyne, sister of the astronomer royal, and sailed for England. He was received there by his family with open arms, by the East India Directors with every mark of respect and admiration. Thus he had reached the first stage in his career, and the attorney's 'booby son' was now esteemed one of England's ablest soldiers.

10. After an unsuccessful attempt to obtain a seat in Parliament, Clive once more repaired to the scene of his early glories, quitting England a second time in 1755. He was gratified before his departure with a lieutenantcolonel's commission in the regular army, and took with him three companies of Royal Artillery and 300 European infantry. Arrived at Bombay, he assumed the command of the little army there, and in conjunction with Admiral Watson's squadron, made an attack upon the rocky fastness of Gheriah, the almost impregnable stronghold of Angria, the Mahratta pirate-chief. In two days it was captured, and levelled to the ground. The pirate fleet was also destroyed, and several minor fortresses were taken. This effected, Clive proceeded to Fort St. David, which he reached in June 1756, on the very day that Calcutta was captured by Suraj-u-Dowlah, and the infamy of the massacre of the Black Hole perpetrated. No long time elapsed before Clive was summoned to Madras, to advise how those terrible misfortunes might be repaired.

It was determined that an expedition should be sent to

the Hoogley, and that Clive should be placed at the head of the land forces. The naval armament was under Admiral Watson's orders. 900 English infantry, well disciplined and full of spirit, and 1,500 sepoys composed this army, which sailed to punish a sovereign who ruled over more subjects than Louis XV. or Maria Theresa. The expedition set sail in October, but, baffled by adverse winds,

did not reach Bengal until December.

11. Clive's operations were marked by his characteristic energy and boldness. He drove out the native garrison from Fort St. William, recovered Calcutta, and stormed Hoogley. He next resolved upon the utter subjugation of Suraj-u-Dowlah, as needful to the secure establishment of British supremacy, and in carrying out his object, showed himself as fertile in the council as he was resolute in the That he descended to the meanest duplicity is unquestionable, but Clive had adopted the maxim of Indian politicians, 'the end justifies the means.' He opened negotiations with Meer Jaffier, the principal commander of the nabob's troops, with Roydullub, his minister of finance, and Jugget Seit, an opulent Indian banker, and the rewards of their treason being settled, Clive put his troops in motion to carry out the concluding details of his ably-conceived project. Suraj-u-Dowlah, in like manner, assembled his immense hosts, and prepared to overwhelm the English little knowing that his general, Meer Jaffier, had arranged with Clive to separate himself from the nabob, with his whole division, before the battle began.

12. But as the crisis approached, the traitor's fears overpowered his ambition. Clive had advanced to Cossimbuzar; the nabob and his thousands lay at Plassey; and yet Meer Jaffier made no sign. The English commander was in a position of no ordinary anxiety. 'He could place no confidence in the sincerity or in the courage of his confederates; and, whatever confidence he might place in his own military talents, and in the valour and discipline of his troops, it was no light thing to engage an army twenty times as numerous as his own. Before him lay a river, over which it was easy to advance, but over which, if things went ill,

not one of his little band would ever return. On this occasion, for the first and for the last time, his dauntless spirit, during a few hours, shrank from the fearful responsibility of making a decision. He called a council of war. The majority pronounced against fighting, and Clive declared his concurrence with the majority. Long afterwards, he said that he had never called but one council of war, and that, if he had taken the advice of that council, the British would never have been masters of Bengal. But scarcely had the meeting broken up when he was himself again. He retired alone under the shade of some trees, and passed near an hour there in thought. He came back determined to put everything to the hazard, and gave orders that all should be in readiness for passing the river on the morrow.'

13. On the morrow the river was passed—river as memorable in the annals of British India, as the Rubicon in the history of Rome—and at the close of a tedious day's march, the army took up its quarters in a grove of mangotrees near Plassey, and within a mile of the enemy.

The famous battle of Plassey was fought on June 23, 1757. It commenced with a cannonade in which the English artillery did fearful execution. The motley hosts of Suraj-u-Dowlah soon fell into disorder, and he himself was smitten with a panic which prevented him from directing their movements or rallying their courage. He ordered his army to fall back. Clive seized the moment to lead his troops to the advance, and before the glitter of the British steel the Bengalese melted away like snow in the sunshine. Their army became a mob. They fled so quickly that only 500 of them were slain, but an enormous booty was left in the hands of the conquerors. With the loss of 22 soldiers killed, and 50 wounded, Clive had dispersed an army of 60,000 men, and conquered an empire larger and more populous than Great Britain.

14. When the news of these wonderful successes reached England, the directors appointed him governor of Bengal. His influence was now immense; his power boundless. He made good use of both. He despatched an expedition

to dislodge the French from the north of the Carnatic. He himself was called upon to oppose a powerful force fitted out by the Dutch, with the view of extending their influence in Bengal. His usual fortune attended him. He defeated their troops and captured their ships, and afterwards forced their authorities at Chinsurah, where they had long had a factory, to dismantle their fortifications and reduce their troops. Three months later he sailed for England, where he was welcomed with acclamations, raised to an Irish peerage, and greeted by the people with pride and delight as a captain of their own, 'whose native courage and self-taught skill had placed him on a level with the great tacticians of Germany.' And this was the second stage of Lord Clive's progress.

15. Clive remained in England until 1764, employing himself in cultivating an extensive parliamentary influence, and in establishing a powerful party among the Directors of the East India Company. He was labouring at these ends with characteristic determination, when events occurred which recalled him for a third time to the plains of Hindostan. During his absence, abuse had succeeded abuse, and corruption fattened on corruption. Every department of the government had fallen into anarchy: 'rapacity, luxury, and the spirit of insubordination spread from the civil service to the officers of the army, and from the officers to the soldiers. The evil continued to grow till every mess-room became the seat of conspiracy and cabal, and till the sepoys could be kept in order only by wholesale executions.' Meanwhile, the natives were ground beneath an intolerable tyranny. Enormous fortunes were made at Calcutta, while thirty millions of human beings were reduced to the extremity of wretchedness. 'The unhappy race never attempted resistance. Sometimes they submitted in patient misery. Sometimes they fled from the white man, as their fathers had been used to fly from the Mahratta; and the palanquin of the English traveller was often carried through silent villages and towns, which the report of his approach had made desolate.'

16. These evils at last attracted the attention of the home

authorities, who felt that but one man in England could cope with them successfully. That man was the victor of Plassey. He was asked to accept the task. He complied, insisting upon certain conditions, which, of course, were readily assented to. As Governor and Commander-in-chief of the British possessions in Bengal, Lord Clive sailed for the third and last time to India. He reached Calcutta in May 1765, and found an enterprise before him which might well have daunted the heart of the boldest. was to be educed from disorder; purity to take the place of corruption; the entire Indian administration to be regulated; justice to be dealt out to natives as well as to Europeans. He at once announced his intention of effecting a thorough reform. A reform?—it was rather a revolution! but in a year and a half he redeemed his pledge. British India was reorganised, and a reform carried out which Macaulay has justly characterised as one of the most extensive, difficult, and salutary that ever was accomplished by any statesman. In courageously dealing with his hydra-headed difficulty, Clive needed all the resources of his powerful intellect and resolute will. 'He knew that if he applied himself in earnest to the work of reformation, he should raise every bad passion in arms against him. He knew how unscrupulous, how implacable, would be the hatred of those ravenous adventurers who, having counted on accumulating in a few months fortunes sufficient to support peerages, should find all their hopes frustrated. But he had chosen the good part; and he called up all the force of his mind for a battle far harder than that of Plassey. At first success seemed hopeless; but soon all obstacles began to bend before that iron courage and vehement will. The receiving of presents from the natives was rigidly prohibited. The private trade of the servants of the company was put down. The whole settlement seemed to be set, as one man, against these measures; but the inexorable governor declared that, if he could not find support at Fort William, he would procure it elsewhere, and sent for some civil servants from Madras to assist him in carrying on the administration. The most factious of his opponents he

turned out of their offices. The rest submitted to what was inevitable; and in a very short time all resistance was quelled.'

17. He returned to England in 1767, after having established the British power in Bengal on a firm and lasting basis. But though he had accomplished services not inferior to those which had thrown so dazzling a lustre over his early career, he was no longer received with a nation's welcome. His energetic reforms had aroused the passions of a host of enemies, whose vindictive cry was swelled by all who hated his genius or envied his success. The popular mind, easily poisoned against the fortunate, inveighed bitterly against his supposed vices. His love of luxuriant living; his magnificent mansions at London, Claremont, and in Shropshire; his wealth, splendour, and ostentation, were magnified into crimes. 'The peasantry of Surrey looked with mysterious horror,' says Macaulay, 'on the stately house which was rising at Claremont, and whispered that the great wicked lord had ordered the walls to be made so thick in order to keep out the devil, who would one day carry him away bodily.

At length, in 1772, the storm broke in all its violence on the luckless head of the hero of Plassey. But he did not succumb. He addressed the House of Commons in a long and eloquent vindication of his career and character, which produced a powerful impression. In the following year the attack was renewed, but Clive's vigour was again equal to the crisis; and he was also defended with much power and skill by Wedderburne, the solicitor-general. He triumphed. After a long and animated debate, Wedderburne moved that Lord Clive had rendered great and meritorious services to his country, and the motion passed affirmatively without a division.

18. But the ingratitude with which he conceived himself to have been treated acted powerfully on a mind which had always been subject to accesses of deep and darkling melancholy. As long as he was in action his energy subdued this constitutional weakness, but in repose it asserted itself with a strange and deadly power. To obtain relief

from disorders contracted beneath an Indian sun, he had recourse to opium, which did but increase the evil and deepen the mischief. Occasionally, indeed, his intellect flashed forth with all its former brightness; but these fitful gleams only heightened, by their contrast, the darkness which preceded and followed them. His strong mind sank at last, and with his own hand he terminated his existence on November 22, 1774, having just completed his fortyninth year.

19. The life of Lord Clive might suggest to a moralist many sound reflections; but it is for us only to point out how forcibly it illustrates the great truth, that success always rewards the efforts of the man who persistently devotes his powers to the attainment of a fixed end. Clive was a man whom no difficulties could hinder nor dangers appal. The aggrandisement of himself, and the extension of his country's power and prosperity, were the two principal objects he had at heart throughout his romantic career, and upon their accomplishment he concentrated all the extraordinary resources of his intellect and character. It is thus that Genius wrestles with Fortune, and throws it.

CAPTAIN JAMES COOK.

1. The great circumnavigator was a remarkable instance of a man devoting himself heart and soul to the profession he had adopted, and flinging his whole energies into the vigorous performance of its duties. By his own persevering efforts he lifted himself from the lowest obscurity to a reputation 'wide as the world itself,' and calculated to endure as long as the discoveries he achieved shall bear fruit for the benefit of humanity. 'But better still,' as Mr. Craik observes, 'than even all this fame—than either the honours which he received while living, or those which, when he was no more, his country and mankind bestowed upon his memory—he exalted himself in the scale of moral and intellectual being; he won for himself, by his unwearied striving, a new and nobler nature, and took a high place among the instructors and best benefactors of

mankind.' This, indeed, is the goal at which all pure and

nobly earnest spirits will endeavour to arrive.

2. James Cook was the son of an agricultural labourer of good character, and born at Whitby, then a poor Yorkshire seaport, in the year 1727. His father was in needy circumstances, and as there were nine children, to none of them could be afforded any educational advantages. James, when thirteen years old, was apprenticed to a shopkeeper at Snaith, a neighbouring fishing-town; but so ardent was his passion for a seafaring life, that he soon released himself from the trammels of an uncongenial trade, and entered into an apprenticeship, for a term of seven years, to the owners of a coaling vessel. Here he employed his time to such advantage that, on the expiration of his apprenticeship, his employers promoted him to the rank of mate on board one of their colliers, and he continued to serve in this capacity, familiarising himself with every detail of his profession, until war broke out in 1755. Then, to avoid impressment, he entered himself on board H.M.S. 'Eagle,' commanded at first by Captain Harmer, and afterwards by Captain Sir Hugh Palliser. The latter, an officer of experience and capacity, soon recognised the superiority of Cook to his comrades, appreciated his love for his profession, and admired his thorough knowledge of its duties—for Cook never suffered an opportunity of acquiring information to pass unheeded—the 'unconsidered trifles' of careless minds he gathered with assiduity as grains of gold worthy of preser-Sir Hugh Palliser promoted his deserving subordinate to the quarter-deck, and further exerted his influence to procure him the appointment of master to the 'Mercury,' a small vessel attached to Admiral Sir Charles Saunders's fleet, in the Gulf of St. Lawrence, a post for which his practical knowledge of navigation peculiarly fitted him. The movements of the fleet being suspended during the winter of 1768 by the severity of the weather, Cook, ever active in the quest after knowledge, employed his enforced leisure in the study of mathematics, and soon obtained a remarkable proficiency in the higher branches of that elaborate science. And he showed how thorough

was his knowledge of his own profession by constructing an admirable chart, which he published, of the River St. Lawrence.

3. His superior proficiency must have been generally acknowledged, inasmuch as he was selected by the Admiral to pilot the fleet destined to co-operate with the heroic Wolfe in the memorable attack upon Quebec. He also superintended the embarkation of the troops, examined the channel of the river, and placed buoys in appropriate spots to assist the navigation of larger men-of-war; displaying in every operation the highest skill and most imperturbable coolness. On one occasion his movements were detected by the enemy, who despatched a large number of boats to cut him off. Cook pushed with all speed for the Isle of Orleans; but so narrow was his escape that his pursuers leapt into the stern of his pinnace as he flung himself ashore from its bow.

4. The operations of the fleet in the Gulf of St. Lawrence were terminated by the conquest of Canada, and Sir Hugh Palliser, now Governor of Newfoundland, and still Cook's steady friend, recommended him to Government as competent to undertake the marine survey of Newfoundland and Labrador. For the purpose of exploring the coast, the 'Grenville' schooner was placed under his orders, and he executed his mission with a zeal and efficiency which signally increased his reputation as a skilful officer, while he demonstrated the soundness of his mathematical acquirements in an admirable paper 'On an Eclipse of the Sun,' which he communicated to the Transactions of the Royal Society.

5. His abilities as a practical navigator and accurate observer marked him out as the man peculiarly fitted for the charge of an important scientific expedition contemplated by the English Government. The phenomenon of the transit of the planet Venus over the sun's disc, calculated to take place in 1769, was regarded by astronomers as an event of great importance and interest to the whole scientific world, and, at the petition of the Royal Society, the Government determined to equip and despatch a vessel

to the South Seas, that its character and effects might be carefully studied in the Western hemisphere. The vessel selected was a stout brig of 360 tons burthen, which had been employed in the coal trade, and from her build and strength was well adapted for coasting or exploring voyages. She was manned by a picked crew of steady and experienced seamen, and liberally supplied with stores of every description. The scientific quota was composed of men of repute-Mr. Green, the astronomer; Dr. Solander, an eminent Swedish naturalist; and Mr. (afterwards Sir) Joseph Banks, a young man of considerable fortune, but of more than ordinary powers of mind and an adventurous disposition. To the command of the 'Endeavour' was appointed, Lieutenant James Cook, who had thus risen, in his forty-first year, from the humble post of a collierbrig's apprentice to the charge of an important scientific expedition.

6. The 'Endeavour' left Plymouth on August 26, 1768, and reached the Strait of Le Maire on the 14th of January in the following year. In due time they arrived at the fair island of Tahiti, or Otaheite, where the natives received them with extravagant demonstrations of welcome. The necessary astronomical observations were carried out with complete success, and interesting researches made into Polynesian botany. Cook next visited the neighbouring islands of Ulietea, Huaheine, Otaba, and Bolabola, and to the whole group he gave the well-known name, expressive of the social habits of their inhabitants, Society Isles. He formally took possession of them in the name of

King George III.

The 'Endeavour' next proceeded to the coast of New Zealand, or Staaten Land, discovered by Abel Tasman, the Dutch navigator, in 1642. Cook here ascertained the existence of a strait which divided this England of the antipodes into two islands. Having minutely explored their shores, he sailed from thence on March 31, 1770, and on the 10th of April made the coast of New Holland. Discovering a secure and noble harbour, he anchored his ship under the southern shore, and endeavoured, but in

vain, to open up a friendly intercourse with the natives. Mr. Banks collected here so extensive a variety of rare and curious plants that, by general consent, the name of

Botany Bay was given to the inlet.

Cook now prosecuted his voyage to the northward, with the view of ascertaining the character of the boundaries between New Holland and New Guinea. In the course of his explorations he incurred the greatest dangers, but braved them cheerfully. 'We chose,' he says, 'rather to incur the censure of imprudence and temerity, which the idle and voluptuous so liberally bestow upon unsuccessful fortitude and perseverance, than leave a country which we had discovered unexplored, and give colour to a charge of timidity and irresolution.' Having examined the channel which broadens between New Holland and New Guinea, and given it the name of Endeavour Strait, Cook and his party landed on a small island, and took possession of the eastern coast of New Holland, with the usual ceremonies, in the name of King George III., and under the appellation of New South Wales. He returned to England in June 1771, having completed the circumnavigation of the world in two years and eleven months, and greatly enlarged the bounds of geographical knowledge.

7. He was selected, in the following year, to command a second expedition of discovery, and was furnished with two stout ships, the 'Resolution,' of 462 tons, which carried his own pennant, and the 'Adventure,' 336 tons, commanded by Lieutenant Furneaux. A liberal spirit inspired every arrangement. Messrs. Wales and Bayley accompanied the expedition as its astronomers, Rumbold Foster and his son as naturalists, and a skilful draughtsman was added to the party. In every detail, however minute, the health and comfort of the crew were studied. for Cook was one of the first to introduce into our vessels the practice of sanitary principles. Provisions of every kind, anti-scorbutics and other medicines, suitable gifts for the savages of the strange lands about to be visited, were supplied in liberal quantities; and, thus equipped, the two discovery ships left Plymouth on July 18, 1772.

They touched at the Cape of Good Hope in November, and then steered southward in search of the great Antarctic continent supposed by some geographers to encircle the South Pole. Vast bergs and huge islands of ice—the coruscating lights of the keen glittering skies—a rolling sea, deep and darkling—it seemed to the voyagers that they had entered a world of mystery and awe.

And through the drifts the snowy cliffs
Did send a dismal sheen;
Nor shapes of men nor beasts they ken—
The ice was all between.
The ice was here, the ice was there,
The ice was all around;
It cracked and growled, it roared and howled,
Like noises in a swound!

COLERIDGE,

Our intrepid adventurer next made for the coast of New Zealand, and sailed 3,660 leagues in 117 days without once catching sight of land. He there refreshed his crews and refitted his ships, and then steered for the islands of the South Seas, revisiting the group which he had explored in his former voyage. He also touched at Middleburg and Amsterdam Islands, and again returned to Queen Charlotte Sound, New Zealand. After an interval of rest and refreshment Cook once more braved the perils of the Antarctic Ocean, and soon convinced himself that it was impossible any land assuming continental dimensions surrounded the Antarctic Pole. 'It can afford,' he says, 'no better retreat for birds, or any other animals, than the ice itself with which it must be entirely covered. I, who was ambitious not only of going farther than anybody had gone before, but as far as it was possible for man to go, was not sorry at meeting with this interruption, as it in some measure relieved us, and shortened the dangers and hardships inseparable from the navigation of the southern polar regions.'

8. Cook now bore away for Easter Island, or Davis's Land, which Bougainville and other navigators had been unable to discover. He fell in with it on March 11.

1774, and found the natives to belong to the same race as that which peoples Tahiti and so many of the Polynesian Islands. The Marquesas, discovered by Mendana in 1595, were next visited, and, after a brief stay at Tahiti, he cruised to the westward, and discovered a group which he named the Friendly Islands, in commemoration of the amicable intercourse that had subsisted between their inhabitants and the English. On the 16th of July, he anchored off Mallicolo, one of a scattered archipelago of islands which Quiros, their discoverer, had mistaken for a portion of the mythic southern continent.

Keeping southward, he visited a group which he named Shepherd's Isles, and a large well-wooded island which, in honour of the First Lord of the Admiralty, he christened Sandwich. Next he discovered Erromanga—afterwards the scene of the murder of the missionary Williams—and thoroughly surveyed the large and important group of the New Hebrides. On his return voyage to New Zealand he discovered New Caledonia, and the steep and mountainous Norfolk Island, formerly a penal settlement of terribly infamous character, and now the home of the descendants of the mutineers of the 'Bounty.'

9. The 'Resolution' anchored in Queen Charlotte Sound on the 10th of October, and the voyagers renewed their friendly intercourse with the manly and courageous New Zealanders. After a month's stay Cook bore away for Cape Horn; examined the coasts of Magellan's Strait and Tierra del Fuego; and, sailing towards the east, discovered the desolate mountain land of New Georgia. Proceeding further south, he fell in with another tract of bleak and frozen country, which he christened Sandwich Land, and then he turned his prow towards the Cape of Good Hope, and in due time arrived at Portsmouth (July 13, 1775), after an absence from England of three years and eighteen days. 'No expedition,' says Mr. Cooley, 'fitted out for the purpose of maritime discovery had ever equalled that from which Captain Cook had now returned, in the magnitude and arduous nature of its peculiar object, and none had ever so completely answered its intentions, and

performed its task with so little loss of lite or injury to

the ships.'

10. Cook's third and last voyage of discovery was designed to settle the disputed question of the existence of a North-west Passage—that is, of a communication between Europe and China by an Arctic or Polar Sea. So desirable was such a discovery deemed that Parliament offered a reward of 20,000*l*. to any adventures who should realise it; and at length the British Government decided upon despatching an expedition for the express purpose of solving a problem which might justly be considered of national

importance.

Under Cook's orders were placed the 'Resolution' and the 'Discovery,' the latter commanded by Lieutenant Clerk. They sailed from Plymouth Sound on July 12, 1776. On Christmas Eve they came in sight of Kerguelen's Land, a region so barren of all the graces of Nature, that Cook appropriately re-christened it the 'Isle of Desolation.' On January 20, 1777, they anchored in Adventure Bay, on the coast of New Zealand. Afterwards they visited Queen Charlotte Sound, and, about the close of February, bore away for the Friendly Islands, where, at Anamooka, they were hospitably received. At Tongataboo they also met with a generous welcome. Tahiti and the Society Islands were next visited, and their 'airy joys of social solitudes' were quitted by Cook and his companions with sincere regret.

11. On January 18, 1778, he discovered a group, which he named, in honour of the First Lord of the Admiralty, the Sandwich Islands. It consists of five islands, of which Atovi is the largest. The inhabitants in language and customs are akin to the Tahitians. Pursuing his course to the northward, our great navigator arrived off the coast of New Albion in March, and, still carrying out his purpose with resolute tenacity, pushed on towards the Arctic regions, until, having doubled the headland of Alushka, he gained, on the 9th of August, the western extremity of the North American continent, and discovered that it was only separated from Asia by the channel known

as Behring's Strait. His further progress was checked by the ice, which rose before them like a massive rampart. some ten or twelve feet high. They regained the Sandwich Islands on the 26th of October; on the 30th, they discovered Owhyhee, which Cook, from its extent and importance, thought worthy of a minute examination, occupying seven days. It was here that Cook's illustrious career was closed by a terrible catastrophe. Yet was his death not unworthy of his life, for it happened through his anxiety to prevent a sanguinary conflict from taking place between the natives and his marines. Endeavouring to secure the safety of the men, with whom he had landed, on a visit to King Terecaboo, and whom he became anxious to re-embark immediately the natives showed signs of hostility, he exposed himself too much, and was unable to escape to his boat. The particulars of his death are thus narrated by one who was an eye-witness of the melancholy tragedy :--

12. 'Captain Cook was the only one remaining on the rock: he was observed making for the pinnace, holding his left hand against the back of his head, to guard it from the stones, and carrying his musket under the other An Indian was seen following him, but with caution and timidity; for he stopped once or twice, as if undetermined to proceed. At last he advanced upon him unawares, and with a large club, or common stake, gave him a blow on the back of the head, and then precipitately The stroke seemed to have stunned Captain Cook; he staggered a few paces, then fell on his hand and one knee, and dropped his musket. As he was rising, and before he could recover his feet, another Indian stabbed him in the back of the neck with an iron dagger. He then fell into a bight of water about knee deep, where others crowded upon him, and endeavoured to keep him under; but struggling very strongly with them, he got his head up, and, casting his look towards the pinnace, seemed to solicit Though the boat was not above five or six yards distant from him, yet, from the crowded and confused state of the crew, it seems it was not in their power to save him. The Indians got him under again, but in deeper water; he was, however, able to get up his head once more, and, being almost spent in the struggle, he naturally turned to the rock, and was endeavouring to support himself by it, when a savage gave him a blow with a club, and he was seen alive no more. They hauled him up lifeless on the rocks, where they seemed to take a savage pleasure in using every barbarity to his dead body, snatching the daggers out of each other's hands, to have the horrid satisfaction of piercing the fallen victim of their barbarous rage.

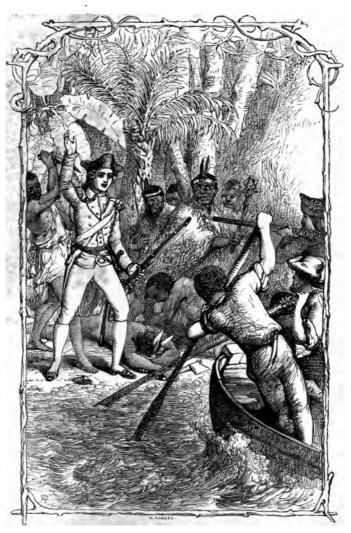
'This fatal accident happened at eight o'clock in the

morning, about an hour after Captain Cook landed.'

13. Thus perished the great English discoverer, at the comparatively early age of fifty-two, on February 14, 1779. He has left behind him a name which England does well to cherish. 'Peace hath her victories,' says the poet, 'no less renowned than war;' and the triumphs which Cook so bloodlessly won, for the benefit of humanity and the advancement of civilisation, are not less deserving of grateful recognition than the victories wrested from the foe on many a deadly field, for the gratification of a nation's pride or a monarch's ambition.

EPILOGUE.

It is unnecessary for us to adduce further examples in illustration of our theme from the careers of men who have become eminent in the naval or military profession. For him who follows the trade of arms, or goes down to the great deep in ships, fixity of purpose and steadfastness of will are as needful, if he would attain to distinction or satisfactorily tread the path of duty, as for the engineer who raises the lighthouse on the wind-swept rock, or burrows a tunnel through the depths of the everlasting hills. 'To scorn delight, and live laborious days;' to endure cheerfully the inclemencies of climate or scarcity of food; to watch, and wait, and persevere; to seize every opportunity of acquiring information; to keep ever in



THE CLOSE OF COOK'S CAREER.

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remembrance the fine old German proverb, 'Den muthigen gehort die Welt,' and to act up to its very spirit:—it is thus that soldier and sailor, or inventor and discoverer, must deserve, and, deserving, command success. And the knowledge that we have done as best we could the work which we had set ourselves to do, that we have zealously 'followed up that 'path of duty' which is also the only true 'path of glory,' will be sufficient to reward us when the dark day cometh, and the silver bowl is broken, though the prizes of success and the laurels of fame be not ours, and we pass away—unheeded, unremembered—

Leaving no memorial but a world Made better by our lives!

CHAPTER III.

EXAMPLES AND ENCOURAGEMENTS FROM THE LIVES OF EMINENT ARTISTS.

Whoever is resolved to excel in painting, or, indeed, any other art, must bring all his mind to bear upon that one object from the moment that he rises till he goes to bed.

SIR JOSHUA REYNOLDS,

PROLOGUE.

1. Art is a jealous mistress, and he who serves her must be content to deposit at her shrine his best faculties, thoughts, energies, and sympathies; must have eyes only for her, ears only for her; and throw his whole soul into her divine and glorious worship. It is, perhaps, from this entire devotion of heart and mind to one sublime inspiration that we have had so few artists of vicious or illregulated lives. They have no time to stray in the garden bowers of Armida, or to dally with Pleasure in the light of purple skies. Art demands their whole service, their utter faith; will have no half confidence; will share her empire with no other ruler. As Sir Joshua Reynolds taught:-'He who is resolved to excel must go to his work, willing or unwilling, morning, noon, and night; he will find it no play, but very hard labour.' He who would be an artist must let the morning sun light up his canvas, and the evening lamp shine on his model of clay. Michael Angelo never ceased to work; not even when all Europe rang with the fame of the sculptor of the sublime 'Moses.' His

favourite device—an old man in a go-cart, with an hour-glass upon it, inscribed Ancora imparo, 'I am still learning!'—illustrates the noble idea he had conceived of the needfulness of constant labour. So with the English sculptor Banks; industry with him almost supplied the place of genius, and he was never weary of inculcating upon the minds of his pupils the necessity of their wholly devoting themselves to the beautiful profession they had adopted. The great Titian was emphatically a Worker. He occupied seven years upon his picture of the 'Last Supper.' Many men will paint a picture in a week, but it lives—a week. 'Why do you charge me fifty crowns,' said a Venetian signor to a sculptor, 'for a bust that only cost you ten days' labour?' 'Because,' replied the artist, 'I was ten years learning to do my work in ten days.'

2. A similar lesson is taught by the life of Chantrey. He was the son of a poor artisan of Norton, near Sheffield, and born there in 1781. His father died while he was yet a child, and his mother married again, not, however, to the improvement of Chantrey's circumstances, whose duty it was to drive an ass laden with milk-cans into Sheffield, and supply his mother's customers with milk. Stepfather and stepson did not agree, and he was accordingly placed with a Sheffield grocer; but chancing to pass one day a carver's shop, the latent poetry in his soul was suddenly aroused. He abandoned the loathsome counter and till, and bound himself apprentice to Mr. Ramsey, carver and gilder, for seven years. Mr. Ramsey also dealt in prints and plaster models, and Francis Chantrey was overwhelmed with happiness. He copied the prints, and imitated the models. No public-house pleasures for him; no rioting or excess; when his master's work was done he laboured earnestly at his favourite pursuits—laboured far into the still darkness of the night. Industry and self-denial enabled him to save a sum of 50l, with which, at the age of twenty-one, he induced his master to cancel his indentures. Determined to be an artist, he travelled, almost penniless, to London, obtained employment as a carver's assistant, and occupied his leisure hours in the sedulous practice of drawing, modelling, and painting in oil. It may be noted, as an encouragement for the persevering, that he was employed as a journeyman upon the decoration of the dining-room of Samuel Rogers, the banker-poet, where he was afterwards a welcome guest, and where, in later life, he would point out with pride the results of his skilful handiwork.

3. After attending for some time the school of the Royal Academy, Chantrey returned to Sheffield, announcing himself as a portrait-painter in oil or crayons. His first commission was given him by a cutler, and his first fee was a guinea; his second patron, a confectioner, was more liberal, and paid him five guineas and a pair of top boots for a portrait in oil. He also proclaimed his ability to model busts in plaster, and a monument to a deceased vicar of Sheffield, from his design, attracted general attention.

In London his studio was a loft over a stable in Newman Mews, where he modelled his first original work for exhibition, a gigantic head of Satan, of which, at a later period, he said to a friend, 'That head was the first thing that I did after I came to London. I worked at it in a garret, with a paper cap on my head; and as I could then afford only one candle, I stuck that one in my cap, that it might move along with me, and give me light whichever way I turned.' This bust was the foundation of Chantrey's fortunes. It was seen by Flaxman, whose noble soul, incapable of jealousy, immediately recognised the young sculptor's genius, and recommended him for the execution of four busts of admirals (Howe, St. Vincent, Duncan, and Nelson) intended to be placed in the Greenwich Naval Asylum. Soon afterwards, he executed his bust of Horne Tooke; a glorious work, so warmly and so justly admired, that it brought him commissions to the amount of 12,000l.

The remainder of his career was a series of brilliant successes. He still worked hard, however, as the record of these successes would show. Painting he had given up, and wholly devoted himself to sculpture; to the rendering of poetry in marble, to making stone eloquent with thought and feeling. Among his most memorable triumphs were:

the beautiful group of the 'Sleeping Children' in Lichfield Cathedral, which it is difficult to look at without growing 'half in love with easeful death,' so exquisitely peaceful is the slumber of those 'images of artless beauty, and innocent and unaffected grace.' The noble manly statue of James Watt; the fine busts of Sir Walter Scott, Wordsworth, Canning, and Sir Robert Peel; and the statues of Lady Louisa Russell, Grattan, Cyril Jackson, Canning, Washington, and Spencer Perceval. To the close of his life he remained the same laborious, hard-working, prudent, but liberal man; independent, unassuming, truthful; and he died, full of years and honours, on November 25, 1841.

- 4. Less splendid in its worldly success was the career of Samuel Williams, the wood-engraver, and he himself was inferior to Chantrey in genius; but not the less was it an illustration of what may be effected by him who devotes all his powers to the acquirement of excellence in the profession he has adopted. Samuel Williams was born at Colchester, in Essex, in 1788. At an early age he cherished the design of becoming an artist, and probably, like most young minds, dreamed of attaining the glory of a Titian, a Rubens, or a Reynolds. His parents, however, apprenticed him to a printer in Colchester, and it was only his leisure hours that he could employ in the cultivation of his beloved art. Gradually he taught himself to design and engrave on wood, and when his apprenticeship came to an end, he boldly started as an engraver, first at Colchester, and afterwards in London. Working early and late, and giving himself up wholly to his profession, he soon obtained abundant employment, and in due time distinction. was scarcely ever seen without pencil or graver in his hand; and such was his industry that few illustrated books of importance appeared for many years without bearing evidence of his originality, skilfulness, and vigour. Of the modern school of artists on wood he may almost be considered the father. He died in 1853.
- 5. Still more interesting as an illustration of a strong will triumphing over difficulties, and of the love of Art nerving the mind to the accomplishment of great things, is

the life of James Sharples. The son of a working ironfounder, he was born at Wakefield, in Yorkshire, in 1825. Soon after his birth his father removed to Bury in search of employment, and, as there were thirteen children, and the resources of the family were very scanty, the boys as carly as possible were made to contribute to the general fund. James, at the age of ten, was employed as a smithy boy in the foundry of the Messrs. Lees. In his twelfth year he went into the service of Messrs. Clarkson and Kay, the engine-makers, where his father toiled as an engine-smith, and where it was the future artist's task, for thirteen or fourteen hours daily, to heat the rivets required by the boiler-makers. The little learning he acquired was derived from his father when the arduous day's work was ended, and it was thus he gained some slight knowledge of reading. Ah, little think the 'sons of affluence,' surrounded by every modern appliance of 'knowledge made easy,' what obstructions beset the path of the poor student when once he is seized by the sublime desire to rise among his fellows, and gain admittance into the brotherhood of Art or Letters!

6. Lying dormant in the smithy boy's breast were the germs of no ordinary powers. They needed but the sunshine of a favourable opportunity to start into life. The opportunity came. He was wont to amuse his leisure moments at home by scrawling with a piece of chalk upon the floor rude imitations of the boilers he saw at his masters' foundries. On one occasion, when his mother expected a relative as a guest, and had prepared the house for her suitable reception, the lad, on arriving at home, began his usual pastime, and the mother and the guest, when they returned, found the floor covered with the design of a monster boiler. Displeased at the dirt he had caused, his mother began to reprimand him, but the aunt interfered, praised the boy's ingenuity, and advised her to place paper and pencils within his reach.

7. James now began his artistic career by copying lithographs of figures and landscapes. He could do no more than copy, because he knew nothing of perspective, or the

laws of light and shade; but, from constant practice, aided by a naturally correct eye, he soon made copies of more than average excellence. At the age of sixteen he attended the drawing class at the Mechanics' Institute, receiving one lesson a week from an amateur professor, by trade a barber, and industriously devoting his leisure at home to the study of reading and writing, that he might be able to master the contents of Burnet's 'Practical Treatise on Painting.' We are told that he devoured it with such eagerness that he would rise at four in the morning to copy out striking passages, and that, returning from his work at seven or eight in the evening, he studied its fascinating pages until a late hour. He still continued his copying of lithographed drawings, and sat up all one night at the absorbing task of copying Leonardo da Vinci's famous 'Last Supper.' A brave man, this Sharples, and worthy to wear the 'blushing honours' of success!

8. His first attempt at an oil-painting was, as might have been expected, a failure; but first failures never discourage men who are truly in earnest. He had bought some canvas, stretched it on a frame, coated it with white lead, procured colours from a house-painter, and set to work. But the colours would not lie smoothly, nor would they dry. It was, emphatically, a daub. In his discomfiture he repaired to his Gamaliel, the artist-barber, who told him how and where to procure prepared canvas and proper oils, and, having purchased a small stock, he began again, and—succeeded!

Do not for one repulse forego the purpose That you resolved to effect.

His first picture, 'The Sheep-shearing,' copied from an old engraving, he sold for half-a-crown; but as he acquired a better acquaintance with the manipulation of his materials, his work was better, and fetched better prices. He toiled overtime, that with the proceeds of his labour he might buy colours, and canvas, and brushes; his easel, and palette, and palette knife, were the workmanship of his own hands. Nine miles would he walk to Manchester

after his day's toil, and nine miles would he walk back, often through rain and hail and snow, to buy one or two shillings' worth of colours! Surely this was the doing of a true hero—of a noble and earnest soul, animated by a

pure ambition, a holy enthusiasm!

9. 'The next pictures painted,' writes Sharples himself, in his graphic autobiographical sketches, 'were a Landscape by Moonlight, a Fruit piece, and one or two others; after which I conceived the idea of painting "The Forge." I had for some time thought about it, but had not attempted to embody the conception in a drawing. I now, however, made a sketch of the subject upon paper, and then procceded to paint it on canvas. The picture simply represents the interior of a large workshop such as I have been accustomed to work in, although not of any particular shop. It is, therefore, to this extent, an original conception. Having made an outline of the subject, I found that, before I could proceed with it successfully, a knowledge of anatomy was indispensable to enable me accurately to delineate the muscles of the figures. My brother Peter came to my assistance at this juncture, and kindly purchased for me Flaxman's "Anatomical Studies"—a work altogether beyond my means at the time, for it cost twentyfour shillings. This book I looked upon as a great treasure, and I studied it laboriously, rising at three o'clock in the morning to draw after it, and occasionally getting my brother Peter to stand for me as a model at that untimely hour. Although I gradually improved myself by this practice, it was some time before I felt sufficient confidence to go on with my picture. I also felt hampered by my want of knowledge of perspective, which I endeavoured to remedy by carefully studying Brook Taylor's "Principles;" and shortly after I resumed my painting. While engaged in the study of perspective at home, I used to apply for and obtain leave to work at the heavier kinds of smith work at the foundry, and for this reason—the time required for heating the heavier iron work is so much longer than that required for heating the lighter, that it enabled me to secure a number of spare minutes in the course of the day. which I carefully employed in making diagrams in perspective upon the sheet-iron casing in front of the hearth at which I worked.'

The 'Forge,' when completed, attracted much attention, and received the approval of the leading artistic journals of the metropolis. Obtaining employment as a portrait painter, Sharples ceased to work at the foundry; but only for a time, inasmuch as, finding that the pursuit of Art offered but uncertain prospects of a regular income, he wisely returned to his smithy, and reserved painting and drawing for the occupations of his leisure hours. He now also commenced to engrave the picture of the 'Forge,' under circumstances which may best be described in his own words:—

10. 'I had seen an advertisement of a Sheffield steelplate maker, giving a list of the prices at which he supplied plates of various sizes, and, fixing upon one of suitable dimensions, I remitted the amount, together with a small additional sum, for which I requested him to send me a few engraving tools. I could not specify the articles wanted, for I did not then know anything about the process of engraving. However, there duly arrived with the plate three or four gravers and an etching needle; the latter I spoiled before I knew its use. Whilst working at the plate, the Amalgamated Society of Engineers offered a premium for the best design for an emblematical picture, for which I determined to compete, and I was so fortunate as to win Shortly after this I removed to Blackburn, the prize. where I obtained employment at Messrs. Yates', engineers, as an engine-smith, and continued to employ my leisure time in drawing, painting, and engraving, as before. the engraving I made but very slow progress, owing to the difficulties I experienced from not possessing proper tools. I then determined to try to make some that would suit my purpose, and after several failures I succeeded in making many that I have used in the course of my engraving. I was greatly at a loss for want of a proper magnifying glass, and part of the plate was executed with no other assistance of this sort than what my father's spectacles afforded, though

I afterwards succeeded in obtaining a proper magnifler, which was of the utmost use to me. An incident occurred while I was engraving the plate which had caused me to abandon it altogether. It sometimes happened that I was obliged to lay it aside for a considerable time, when other work pressed; and in order to guard it against rust, I was accustomed to rub over the graven parts with oil. But on examining the plate after one of such intervals, I found that the oil had become a dark sticky substance, extremely difficult to get out. I tried to pick it out with a needle, but found that it would almost take as much time as to engrave the parts afresh. I was in great despair at this, but at length hit upon the expedient of boiling it in water containing soda, and afterwards rubbing the engraved parts with a toothbrush; and, to my delight, found the plan succeeded perfectly. My greatest difficulties now over, patience and perseverance were all that were needed to bring my labours to a successful issue.'

The plate was in due time produced, having occupied in its execution the leisure time of five years. Its engraver still continues, we believe, his course of successful industry, and to 'point the moral' of his pure and honourable life, that our fortune is in our own hands, and that 'Heaven helps those who help themselves.' When Moscheles had completed the arrangement of Beethoven's 'Fidelio' for the piano, he took the score to the great massiro, who, observing that he had written on the last page, 'Finis, with God's help,' immediately wrote underneath, 'Nay, man, help thyself!' Jupiter looks but coldly upon those who will not themselves put their shoulders to the wheel, and for every man there is a prosperous future, if he has the courage to hope

and the energy to dare.

11. Not less in the pursuit of music than in the study of sculpture or painting is this self-devotion upon which we so strongly insist an absolute necessity. Run over the roll, a bright and glorious one, of eminent musicians, and you shall scarcely find thereon the name of one that was afatigable plodder, giving himself up wholly to cultivated. Look at Handel: he accomplished

in his lifetime the work of a dozen ordinary men. When a boy his father forbade him the practice of music, but he concealed a small clavichord in a garret, and studied it with suppressed affection when the family were all asleep. At the age of seven he was removed to the Court of the Duke of Saxe-Weissenfels, to whom his sister's husband was valet, and there he contrived to obtain access to the organ loft, and practise on that sublime but difficult instrument. The Duke, accidentally hearing him play, was surprised at his proficiency, and remonstrated with his father on the folly of attempting to crush a genius so extra-The lad was accordingly placed under proper instructors, and when but twenty years old brought out his first opera, 'Almira.' He now entered upon a career as remarkable for its industry as its success, and produced those magnificent oratorios which place him as indisputably at the head of all musical composers as Shakspeare is at the head of dramatic poets. In one year his prolific genius gave birth to the chefs d'œuvre of 'Saul,' 'Israel in Egypt,' and 'Alexander's Feast,' besides the opera of 'Jupiter in Argos,' and 'Twelve Grand Concertos.'

12. 'Work' said Mozart, 'is my chief happiness,' and of the truth of the saying his brief life was a remarkable illustration. He was born in 1756; he died in 1792. In the interval he wrote six grand operas, each of which is immortal; the glorious 'Requiem,' the serenata of 'Ascanio in Alba,' besides masses, concertos, symphonies, and sonatas in wonderful profusion and almost unapproachable excellence. When he was four years old he could play pieces on the harpsichord with accuracy and good taste. In his fifth year he produced an elaborate concerto, and in his sixth, was introduced to the Court of Vienna, when the Emperor Joseph, a connoisseur of some ability, was surprised at the extent and fertility of his resources. Thenceforth his whole life was devoted to his art, and his correspondence is almost entirely occupied with the details of his labours, and a record of his progress. Not even the visible approach of death could quench his ardour. The 'Zauberflote,' 'La Clemenza di Tito,' and the 'Requiem,' were among his

last efforts. The composition of the latter, in the decline of his bodily powers, and under severe mental excitement, hastened his end; he was seized with repeated fainting fits, brought on by his extreme assiduity in writing, in one of which he expired. As he drew near to death, the grandeur of his ideas became still more obvious; the music of the Requiem is truly funereal, a mixture of sublimity and heartfelt entreaty; and it was the excitement produced by the crowd of images which came unsought before his mind that hastened his death. A few hours before that event took place, he is reported to have said, 'Now I begin to see what might be done in music.' Like the fabled Dying Swan, his last song was his own dirge:—

At first to the ear
The warble was low, and full, and clear,
And floating about the under-sky,
Prevailing in weakness, the coronach stole,
Sometimes afar, and sometimes anear;
But anon, the awful jubilant voice,
With a music strange and manifold,
Flow'd forth in a carol free and bold.

In support of the propositions we have put forward, we again proceed to furnish some detailed biographical illustrations

EXAMPLES.

JOHN FLAXMAN.

1. Those who have had an opportunity—and who has not?—of gazing upon Flaxman's fine monument to 'silvertongued Murray,' Earl of Mansfield, in Westminster Abbey, or his classic illustrations of Homer and Dante, Æschylus and Hesiod—illustrations redolent with the true spirit of antique Art—cannot fail to have felt the force, power, and beauty of the genius of the sculptor; than whom, until John Gibson appeared, England had produced no artist of so pure and refined an imagination. Flaxman rose to the highest place in his profession, not by the aid of adventitious circumstances, but by the strength of his

devotion to his art, and the assiduity with which he followed out the cherished object of his aspirations.

John Flaxman was born at York in the year 1755. His father, a modeller of plaster casts, soon afterwards removed to London, where he settled in New Street, Covent Garden, and obtained employment from Roubilliac the sculptor. He also kept a shop for the sale of busts and statuettes, and casts from the antique, in plaster. The boy Flaxman's health was so infirm that, behind the counter in this shop, he actually sat, supported by pillows, reading, or gazing dreamily upon the works of Art around him-Venus springing from the Sea, Ajax defying the Thunder, the immortal group of the Laocoon, or the still beauty of the Belvidere Apollo. On one occasion, a clergyman named Matthews observed him trying to plough his way through a volume apparently very difficult, and, finding that it was a Cornelius Nepos, he told him it was hardly a book suitable for his age or acquirements, but he would bring him a proper one on the morrow. He kept his word, and thus commenced an acquaintance which ripened into a life-long friendship. The young Flaxman was supplied with the works of our best classics, with the evergreen 'Don Quixote,' Pope's translation of 'Homer,' with Milton and Spenser, and similar volumes, on which his imagination eagerly fed, until the hand laboured to embody what the brain conceived. In black chalk he covered sheet after sheet of canvas with sturdy Hectors and graceful Venuses, with 'ox-eyed' Junos and 'blue-eyed' Minervas; the glorious visions of Homer having a greater attraction for his youthful fancy than the dreams of any other poet. His father showed some of these imperfect sketches to Roubilliac, who had little sympathy—as his sculptures prove —with the simplicity of the antique, and at the boy's crude semi-classicalities the prosperous sculptor only grunted out a coarse-tempered 'pshaw!' Flaxman, however, was not discouraged, but continued to labour at his books and drawings, to model in wax, and clay, and plaster, and to take impressions from every seal or medal on which he could lay his hands. A cripple, and unable to limp about

except with the aid of crutches, application became to him all the more a necessity and a pleasure, and the youthful student was laying up stores of poetry and fancy which afterwards served him well.

- 2. As he grew older he grew stronger, and, being able in time to walk without help, he went frequently to the house of his patrons—Mr. and Mrs. Matthews—who gave him lessons in Greek and Latin, and assisted him to an appreciation of what was true and beautiful in the books he read. He continued his sketches in black chalk, but apparently with little success, if the story be true, that on showing his drawing of an eye to the artist Mortimer, the latter ironically exclaimed, 'Is it an oyster?' Genius, however. is not to be slain by ridicule. It is only the weaker order of minds that succumb to the 'slings and arrows' of illnatured wit. The boy-artist continued to draw, and daily to draw better, until he at length obtained a commission to make six original studies from Homer, in black chalk. felt now that his foot was on the first step of the ladder, and gazed steadily at the laurel crown which shone in the depths afar. The work was carefully done; was liberally rewarded; and Flaxman gained a feeling of confidence in his own powers.
- 8. In 1770 he was admitted a student at the Royal Academy, where he formed an acquaintance, based on kindred sympathies and congenial tastes, with Blake-'Pictor Ignotus'—then in his twenty-first, and Thomas Stothard, then in his fifteenth year. Flaxman's abilities were speedily recognised by his fellow-students; nor was their estimate of his powers falsified by the event. He won the silver medal in 1771, and it was supposed, in the following year, that he would gain the gold one. It was acquired, however, by one Engleheart, whose after-career passed in utter obscurity. The defeat nerved the young artist to fresh endeavours. He was determined to show what stuff there was in him, and silently addressed himself to a course of severe and systematic study. Meanwhile, to assist in the maintenance of his family, he was constrained to labour at his father's trade, and to fill up the intervals of study with

such work as he could get to do. Thus month after month passed by; Flaxman daily approaching nearer and nearer to that ideal of excellence which his fond ambition set before him, when a circumstance occurred which suddenly

opened up the road to fame and fortune.

4. Wedgwood, the father of the English pottery manufacture, was continually on the watch for fresh talent to enlist in his service, and improve the ware which his perseverance and ingenuity had made so important a staple of English trade. He was anxious to place within the reach of the humblest artisan forms of beauty and of grace which should insensibly elevate their tastes and refine their ideas. The name of Flaxman was mentioned to him as that of a skilful designer, and one, moreover, thoroughly imbued with the spirit of Greek Art. He found him out, and an interview took place (see chapter I.) which was equally satisfactory to artist and patron. The former obtained a permanent income from a congenial employment, the latter, the services of an artist who fully understood the nature of the work required of him, and was admirably competent to execute it.

5. Flaxman continued for many years to supply Mr. Wedgwood with designs, many of rare and exquisite beauty, all marked by a classic grace and elegance. For examples of form he studied the Etruscan vases, and figures of the finest shaped utensils made use of by the ancient Greeks he found in Athenian Stuart's elaborate folios on the 'Antiquities of Athens.' These he enriched with beautiful little groups, in very low relief, of subjects borrowed from Homer and Hesiod, and the romantic history of the old world. Thus he was one of the first labourers in a field which of late years has been largely cultivated—the popularisation of Art among the masses, and the introduction to the vulgar mind of new and refining influences in forms and outlines,

Not yet dead, But in old marbles ever beautiful.

6. In the year 1782, Flaxman married an admirable young woman, named Ann Denman, and set up

housekeeping in Wardour Street, Soho Square. Sir Joshua Reynolds visited him there, and—cynical old bachelor that he was!-exclaimed, 'So, Flaxman, I'm told you are married. Well, well, you are ruined for an artist.' Flaxman repeated the great painter's prophecy to his wife. 'Ruined for an artist!' she exclaimed. 'How has it happened, John?—and who has done it?' 'It happened.' he replied, 'in St. Martin's Church, and Ann Denman has done it. Sir Joshua holds,' he continued, 'that to be a great artist one must devote oneself wholly to one's art. and above all must study the works of the immortal masters of Rome and Florence. And, ah, I would wish,' he cried, 'to be-a great artist!' 'Even so you shall be,' rejoined the true-hearted wife, 'and visit Rome and Florence also, if it be needful.' 'And how?' said Flaxman. 'You work, and I will economise,' she replied; 'for it shall never be said that Ann Denman ruined John Flaxman as an artist.'

They worked and economised for full five years, and then the sculptor's dream was accomplished. Without help from patrons, or assistance even from the Academy, which often extends pecuniary aid to its more promising students, the earnest twain, in 1787, set out for Italy. They settled themselves at Rome, and abided there for seven years. Surrounded by the immortal masterpieces of the Art of the Elder World, the full currents of Flaxman's genius were unloosed. As yet he had but faltered on the threshold; now, with firm step, he strode into the Enchanted Land. At first he maintained himself by making copies from the antique, but soon it was noised abroad that the English sculptor was a man of rare and original fancy. Thomas Hope, the author of 'Athanasius,' commissioned him to execute a group of 'Cupid and Aurora,' and the Earl of Bristol (Bishop of Derry) the 'Fury of Athamas;' four colossal figures, for which he was paid 600l. A London publishing house employed him to execute his beautiful designs in illustration of Homer, Hesiod, Æschylus, and Dante, for which, however, he did but receive fifteen shillings a piece. The Academies of Florence and Carrara elected him a member, and, with a reputation which widened daily, Flaxman returned to

England in 1794.

7. Having shown what success attended this great artist's unselfish devotion to his art, we need not linger over the latter stages of his honourable career. He executed the monument to Mansfield in Westminster Abbey; seeing which, the prosaic Banks had wit enough to proclaim, 'This little man cuts us all out!' His other notable works were, the monuments to Nelson, Sir Joshua Reynolds, the poet Collins, John Kemble, Earl Howe, and the Barings; the illustrations of the 'Lord's Prayer;' the magnificent poem in marble of 'Michael vanquishing Satan;' and the glorious 'Shield of Achilles.' In 1810, he was appointed Professor of Sculpture to the Royal Academy, and the 'Lectures' he delivered were replete with valuable suggestions and noble counsels. In 1826, he died, in his seventysecond year, leaving the memorials of his genius to enrich our grand old English cathedrals, and not a few of our quiet English churches. The history of British Art may glow with greater names, but assuredly with none purer or nobler, than that of the sculptor John Flaxman.

JAMES BARRY.

1. This eminent artist, a man of irregular but decided genius, was born at Cork, in 1741. His father, at the time of the future painter's birth, was the master of a small coasting vessel that plied between Cork and Kinsale, and sometimes even stretched across to the English coast: In working his craft he was assisted by a man and two boys, one of whom was occasionally his own son, until the father found it hopeless to inoculate him with a love of a seafaring life. The lad loved better to lie along the deck, sketching with a charred stick any object that caught his fancy, than to handle tarred ropes and furl rebellious sails. 'It is you who have ruined him,' the angry father at length exclaimed to his wife; 'as you brew, so may you bake. Take him home and make a scholar of him; he's fit for nothing else.'

- 2. Though he no longer encountered his father's opposition in following up the natural bias of his genius, he had to contend with the weakness of his mother, who, from anxiety for his health, or apprehension of fire, would steal away his candle that he might neither read nor draw. Nevertheless he was sent to school, where he was distinguished by his eager love of knowledge, and acquired a deep love of classic poetry and the wonderful myths of the ancient fable-world. 'His love of Art, drawn in with the air he breathed upon his native shores, assumed daily a more tangible form, and he pictured forth upon the doors and walls rude sketches of Æneas escaping with his family from the sack of Troy, and other illustrations of classic subjects, which, according to the vague memoirs that remain of his childish days, elicited the admiration of his schoolmates and the reproofs of his master. 'His mother's ambition, however,' continues Mrs. S. C. Hall, 'was the ambition of many of her class; she desired to devote the boy who had such genius to the service of the God who gave it. If she could only once see him "serve mass," she had been often heard to declare, she would die a happy woman. But, though the imposing forms and ceremonies, its strict fasts and rigid observances, caught firm hold of the youth's imagination, and there can be little doubt but the ascetic denials to which in his first youth and latter days he subjected himself grew out of his belief in the necessity for religious discipline, yet his soul was Art, and to its highest calling he devoted himself, with as much zeal as could be contained in one human heart.'
- 3. He led, it is true, a life of the most rigorous self-denial—an unwise life for one of his dark and morose temperament, as it failed to cherish the better feelings of his nature—but he studied with the utmost ardour. Having no money to buy books, he borrowed all he could, and either transcribed or committed to memory the passages he liked. It is said that after his death volumes of these transcripts were found among his papers.

and laboured eagerly at the art without anyone to

notice or encourage him. Among his earliest performances were designs of 'Susannah and the Elders,' Daniel in the Lion's Den,' and the 'Escape of Æneas from Troy.' These pictures remained suspended on the walls of his father's house long after his reputation had extended over Europe. The first work which he deemed worthy of exhibition was composed on a striking subject: St. Patrick baptising the King of Cashel, who stands unmoved while the holy rite is performed, though the Saint, without knowing it, has struck the iron point of his crosier through the royal foot, and all around gathers a circle of wondering spectators. picture he sent to Dublin, where it was placed in the exhibition room of the Society for the Encouragement of Arts and Manufactures. Though the work of an unknown artist, it compelled universal admiration. Barry, dressed in the rude attire of an Irish peasant, mingled with the crowd, and listened delightedly to their warm expressions of approval. His heart throbbed quickly as the murmur of applause ran round, but when the great Edmund Burke came forward, and added his quota of praise—praise infinitely valuable from a judge of such imagination and genius-he could no longer restrain himself, but cried out, 'I, I am the painter!' and, overwhelmed by a torrent of emotions. burst into tears and rushed from the room.

4. Barry now became the favourite of the best society of the Irish capital, and was led into a round of gaieties which his good sense told him would speedily ruin him as an artist. He roused himself from the Circean dream, and, returning one night from a brilliant bacchanalian revel, he flung all the money he had in his pocket into the river, as the cause of the excesses into which he had been betrayed. From that day he returned to his studies and his ascetic self-denial.

Through the generosity of Edmund Burke he was enabled to complete those studies where every true artist turns for the last inspirations of his Art—at Rome. He first repaired, by Burke's invitation, to London, where he made copies of some paintings in oil for Athenian Stuart. Towards the close of the year 1765, he left London for the Continent,

and, passing through France, proceeded to the 'Eternal City.' He remained there six years, the funds for his support being provided by the generous Burke, and Barry's two elder brothers. Throughout this long apprenticeship to Art, Barry toiled hard, for his was not a nature to shrink from work; but his peculiar temperament, aggravated by the circumstances of his early life, brought him into frequent collision with his fellow-students. Burke tendered him again and again the most friendly advice, couched in the most delicate language; warning him that 'the arms with which the ill dispositions of the world are to be combated, and the qualities by which it is to be reconciled to us, and we to it, are moderation, gentleness, a little indulgence to others, and a great distrust of ourselves;' but the wild Irish nature and impetuous genius of Barry

spurned control and brooked no restraint.

5. He returned to England, and became involved, as Burke had predicted, in a succession of personal squabbles, which lowered his self-respect and affected his reputation. He painted several pictures for exhibition, all giving proof of his possession of no ordinary powers, but all marked by characteristic defects, which the critics he had offended by his self-assertion were prompt to discern and censure. Thus, he produced a picture on the 'Death of Wolfe,' wherein he represented all the characters naked, in accordance with those false canons of Art which condemned the use of modern costume. Benjamin West, at the same time, composed his famous picture on the same subject, introducing the figures in the dress they had actually worn, and the public, generally correct in its tastes and feelings, decided in favour of West and truth. Barry grew more and more morose. He neglected his person, and yielded to 'slothful and uncleanly habits,' and, having gone out of his way to attack and quarrel with Sir Joshua Reynolds, he also lost for a time the friendship and countenance of Burke. Meanwhile, he was suffering from all the agonies of poverty.

6. Yet the brave soul of this unfortunate man never succumbed. His devotion to Art was as thorough and unselfish as ever. As he himself said, 'Every day he

centred more and more in his art; he gave himself totally to it, and, except honour and conscience, was determined to renounce everything else.' He occupied a small tenement in Castle Street, which had become his by bequest, but which, from want of funds, he was compelled to suffer to fall into ruin. Here he composed his 'Inquiry into the Real and Imaginary Obstructions to the Acquisition of the Arts in England,' an elaborate reply to the sneers of those arrogant Continental critics who pronounced the climate and soil of England unfavourable to the cultivation of the arts. As a further and more convincing reply, as an undying vindication of British painting, he resolved upon the composition of a series of classical cartoons, and proposed to the Society for the Encouragement of Arts, Manufactures, and Commerce, to adorn their great room in the Adelphi with suitable compositions, on condition that he was allowed to select his own subject, and was provided with the necessary canvas, paints, and models. The theme he chose was the 'Progress of Human Improvement,' which he proceeded to illustrate in six pictures. The first was emblematical of the early dawn of civilisation, when mankind was just awakening to a knowledge of the refining influences of music, law, and religion; the second, of the age of agriculture, when men began to earn their bread by the sickle and plough; the third, of the establishment of order, and the growth of literature, art, and science; the fourth, of the triumphs of man upon the seas; the fifth, of the age of commerce and manufactures; and the last, of Elysium, and the eternal bliss of the virtuous in a future world. When he commenced this great labour, which occupied him nearly seven years, he had but sixteen shillings in his pocket, and daily, after working at his cartoons from sunrise until sunset, he retired to his dilapidated tenement in Castle Street, to sit up half the night painting or engraving for the booksellers, that he might earn enough to purchase his scanty fare. What a strong, brave, earnest heart was this! Assuredly he deserved to realise his enduring ambition, and win the fame for which he toiled so hard.

7. As the work progressed, Barry's friends made an

application on his behalf to the Society which profited by his labours; but it was not until after a long delay that they wrung from its authorities a gift of a hundred guineas. When the noble toil was ended, they presented him with two hundred guineas more, and allowed him to exhibit the pictures to the public, by which he realised five hundred pounds. These sums, together with about two hundred and fifty pounds, the gifts of some affluent admirers of his genius, were all the remuneration he received for his six years' arduous work. He placed them, with unwonted prudence, in the funds, and they yielded a small yearly income which abundantly sufficed for his few and simple wants.

- 8. His latter years were comparatively calm and tranquil. He continued to study assiduously, and completed many works of merit, though he never became a favourite with the public. Elected Professor of Painting to the Royal Academy, he delivered a course of lectures which eminently illustrate the man's enthusiastic devotion to his art, and the ardour with which he concentrated all his powers upon the one great object of his life-long worship. Soon after their delivery he unfortunately quarrelled with the Council of the Academy, whom he had unquestionably insulted, and though strongly supported in the hot battle he fought by the sculptor Nollekens, was beaten, and dismissed from his professorship. Trusting he had now had enough of strife and contention, his friends came forward and raised a subscription of 1,000l., upon which Sir Robert Peel, the father of the late distinguished statesman, granted him an annuity. The same generous hand, after Barry's death, set up a monument to his memory in St. Paul's, and paid the expenses of the funeral.
- 9. His death was as singular as his life was eventful. Dining,' says Mrs. S. C. Hall, 'at a cheap house, he was seized with a sudden and violent illness; death had given him the unerring blow, and his great heart quivered under the shock. He was borne to the door of his lonely dwelling, and it could not be opened—some of those evil urchins who run about the streets had plugged the keyhole with

The night was dark and cold; and, shivering with disease. Barry was carried to another abode. He was one of those strong men who cannot bear their weakness to be known. In his strange room he locked himself for forty hours, bearing his physical agony, it would seem, unheeded. At last he strayed out to make his complaint —for nature will have way—and the physician sent him to his friends Mr. and Mrs. Bonomi, who now managed to The struggle was not strong, receive him into their house. but terrible. He was a Christian hero to the last, talking cheerfully and kindly to those around him, anticipating, but not fearing, death. If he had summoned the same mild fortitude to his aid through life, he would have lived a happier man—happier and more useful, for his powers would have been doubled, increasing by the exercise of the proprieties and suavities which sway, and ought to sway, society; and, adding unto admiration love, the combination would have given greater might into his single hands than was ever possessed by any British painter. He lingered for ten or fifteen days, and then expired, in the sixty-fifth year of his age (February 1806).

The repute which Barry obtained he owed entirely to his unwearied application and natural capacity. That repute would have been wider and more permanent had it not been for the unfortunate defects of his character, his impetuosity, self-assertion, and contempt of social conventionalities. His life is, therefore, at once an example and a warning, by which, we trust, our younger readers will

take heed to profit.

RICHARD WILSON.

1. RICHARD WILSON, the third son of a clergyman in Montgomeryshire, was born in 1714. His father, soon after his birth, was appointed to the living of Mold, in Flintshire, considering himself as 'passing rich with forty pounds a year.' The future artist, therefore, was early accustomed to privations, and as early displayed a remarkable talent for drawing. He seized every opportunity, in

his leisure moments, of covering the walls with faces and figures which he drew with a burnt stick. It is related of him that in his youth he painted for the village inn of Llanverris the sign of two grinning heads, with the motto, 'We three loggerheads be,' whence that village is now familiarly known through all the country-side as 'Loggerheads,'

2. His love of Art was so ardent, his devotion so sincere, that he endured all the miseries of poverty rather than abandon the profession in which he hoped to rise to eminence. He made his way to London, and laboured night and day to secure a scanty livelihood. The different lodgings which he inhabited in the metropolis are known to have been—over the north arcade of the Piazza, Covent Garden; in Charlotte Street, Fitzroy Square; in Great Queen Street, Lincoln's Inn Fields; at the corner of Foley Place. Great Portland Street; and in Tottenham Street, Tottenham Court Road. To the Exhibition of 1760 he contributed a picture of 'Niobe,' which was purchased by William Duke of Cumberland. The poor painter thought he was now on the threshold of prosperity; but the public did not follow the lead of his princely patron, and Wilson sank deeper and deeper into difficulties. He had not as yet discovered the true bent of his genius, but addicted himself to portraitpainting and classical subjects, until, one day, having called at the house of Zucarelli, and growing fatigued with waiting for him, he amused himself by painting the scene which the chamber window overlooked. Zucarelli, when he arrived, was so delighted with the sketch that he asked Wilson whether he had ever studied landscape, and, receiving an answer in the negative, exclaimed, 'Then I recommend you to try, for you are sure of great success.'

3. The great success did not come at first, however. For his beautiful sketches, which are such vivid and truthful transcripts from nature, he received but half-a-crown a piece, and great was his gratitude when Paul Selby paid him a shilling or two more. But Wilson was not actuated have mere greed of money; he loved his art for his art's

sake, and was sufficiently rewarded for his labours by his

delight in the excellence he attained.

'An easel, a brush, and a few articles of furniture,' says an eloquent writer, 'not as many as a mechanic would need, were all he could afford, while producing what are now the richest ornaments of our most costly mansions chiefest of our national glories in Art! Ah! who can read without sympathy the story that in such a dwelling he was found by a youth, a student, whose name, although forgotten on earth, is recorded in heaven! The lad was asked by a lady to conduct her to the greatest landscape painter, to whom she wished to give a commission. He took her to Wilson's studio; she commissioned two pictures, and drove off. Wilson detained his young friend, and, looking him mournfully in the face, murmured, "Your kindness is vain; I am wholly destitute; I cannot even purchase proper colours and canvas for these works." The young man lent the great artist twenty pounds, and drew a salutary lesson from the distress it was his privilege to relieve. Could he expect to prosper where Wilson, with all his genius, was starving? He laid aside his palette and brushes, entered college, and became a clergyman—a calling of which he must have been very worthy. Wilson was inexpensive in his habits; his luxury was "a pot of porter and a toast"—sufficiently unrefined to cause his enemies to sneer, and his admirers to regret that he could afford no In those days, artists and authors were frequent friends, aiding each other by an interchange of mind that must have been vastly beneficial to both. There were no clubs then; and those who had no homes wherein to meet their friends, would meet them at a tavern: it was at the Turk's Head, in Gerrard Street, Soho—in really good society—the great landscape painter of England forgot that he was poor.'

4. His genius struggled into slow recognition, but of mere worldly success his share remained but scanty, and he was compelled at length to solicit the office of Librarian to the Royal Academy, of which, at its establishment, he had been chosen one of the first members. He still, however,

found consolation enough in the practice of his art to enable him to endure with equanimity the 'alings and arrows' of uncertain fortune, and, sedulously devoting himself to labour, acquired that extraordinary excellence which has marked him out the prince of English landscape-painters. The death of an elder brother placed him, at last, beyond the reach of want, and he retired to the House of Colomondie, near the village of Llanverris, to practise his art in serene enjoyment of a green old age. He died in May 1782, in the sixty-ninth year of his age, and his remains lie interred in the quiet churchyard of Mold, covered by an unostentatious tomb of stone.

SIR DAVID WILKIE.

 The life of this great artist deserves a more particular account than our narrow limits will enable us to afford.
 We can but indicate the slow and gradual steps by which

he rose to greatness.

Sir David Wilkie was the son of a poor Scotch minister. and was born in 1785, near Cupar in Fifeshire. early age he displayed a remarkable love of Art, and, while the reproach of his schoolfellows and the bet noire of his schoolmaster, from his inattention to his regular lessons, he occupied every leisure hour in sketching faces and figures. imaginary or real. Drawing was his passion, and he suffered no opportunity of indulging it to pass unnoticed. He seldom entered a cottage without leaving a memorial of his industry on its walls. He would draw in the smooth sands of the river, or on any convenient boarding that caught his eye. His powers of observation were remarkable, and it was during his thoughtful, self-concentrated boyhood that he accumulated in his memory those Scotch peasants, mendicants, and fiddlers, whom he afterwards reproduced upon his eloquent canvas. His father, who was a strict Presbyterian, and looked upon painting as a violation of the Second Commandment, was at length obliged to yield to Wilkie's ardent enthusiasm. The lad obtained admission to the Scottish Academy at Edinburgh. His first specimens were rejected on account of their crudeness, but he persevered until he produced better, and became a successful candidate.

- 2. Here he was distinguished by his unwearied application and sedulous perseverance, rather than by any striking demonstrations of extraordinary power. He worked hard, attended lectures punctually, and devoted himself with special industry to anatomical studies. He was determined to succeed, and, as he believed himself wanting in genius, endeavoured to supply its place by unremitting diligence. 'The single element,' he said, 'in all the progressive movements of my pencil was persevering industry.' Graham, his master, was accustomed to repeat to the students the noble words of Reynolds:—'If you have genius, industry will improve it; if you have none, industry will supply its place.' 'So,' said Wilkie, 'as I knew I had no genius, I was determined to be very industrious.' The same humility distinguished him when studying in London. He always kept as close as possible, he said, to his fellow-students Linnell and Burnett, when they were conversing upon artistic subjects, 'because,' said he, 'they knew a great deal, and I very little.'
- 3. After obtaining several premiums at Edinburgh, and completing his first domestic picture, 'Pitlessia Fair,' Wilkie, in his twentieth year, removed to London. Here his career of fame commenced with the production of the 'Village Politicians,' painted while his weekly income seldom exceeded eighteen shillings. It broke upon the Artworld like a thunder-clap, and judicious critics immediately recognised the appearance of a new and shining star above the horizon—of the founder of a new school of genre painting. Commissions flowed in upon him; but yet Wilkie did not acquire a rapid fortune. He was too conscientious a worker; too carefully elaborated the details of every picture. Nothing was done hurriedly or imperfectly; for he worked for Posterity, and Posterity, though an impartial, is usually a severe judge. The 'Village Politicians' was bought by Lord Mansfield for 301.—a sum which Wilkie

mainly expended in domestic comforts for the beloved

denizens of the far-away Scottish manse.

4. His reputation rapidly increased with each successive picture, in which the broad lights and shadows, the pathos and humour, of everyday life were painted with a powerful and nervous pencil. The 'Blind Fiddler,' the 'Rent Day,' 'Distraining for Rent,' 'Blind Man's Buff,' and the 'Penny Wedding,' are compositions which, of their kind, may fairly be pronounced unequalled and inimitable. has had many followers, but not one rival. In 1811, he was elected a Royal Academician. In 1823, he painted for the Duke of Wellington, who gave him 1200l. for the picture, his famous 'Chelsea Pensioners reading the Gazette of the Battle of Waterloo.' Soon afterwards, his health being seriously impaired, his physicians recommended him to travel on the Continent; but he could not wholly desist from work, and, in Spain and Italy, formed that more picturesque, but scarcely so successful, style which marks his later pictures—his 'Maid of Saragossa,' the 'Guerilla's Departure,' the 'Discovery of Tippoo Saib's Body' (for which the widow of Sir David Baird paid him 15001.), 'Columbus,' 'John Knox Preaching,' and the 'Empress Josephine and the Fortune-teller.'

5. In January 1830, on the death of Sir Thomas Lawrence, he was appointed principal painter-in-ordinary to George IV.; whose portrait, in Highland costume, he was then painting, and 'His Majesty's Reception at Holyrood House.' The royal favour was continued to him by William IV., who conferred upon him the honour of knighthood in 1836. Queen Victoria commissioned him to execute a painting of Her Majesty's 'First Privy Council,' and afterwards, by the royal command, he set out for Constantinople to paint the portrait of the Sultan. It proved a fatal mission. On his homeward voyage, on board the 'Oriental' steamer, he was seized with a sudden illness, which carried him off on June 1, 1841, aged fifty-six. His body was

committed to the deep in Gibraltar Bay.





BENJAMIN WEST.

- 1. Benjamin West was born at Springfield, near Philadelphia, U.S., in the year 1738. His parents were Quakers, of reputable English descent, and he was the youngest of ten children. It is related that his mother brought him into the world immediately after being terrified almost into convulsions by a sermon, in which the preacher scarcely brightened the horrors of the description that he gave of the coming destruction of the Eastern hemisphere by his promise of a happier destiny for the Western, where a state of immaculate virtue and unclouded bliss was to prevail after vice and folly and sorrow had been swept from the face This incident was not without its influence of earth. on the future artist's career, inasmuch as the clerical orator, gratified by what he supposed to be a proof of the powers of his eloquence, was always predicting to the pleased parents that their son, born under such remarkable circumstances, would assuredly turn out a remarkable man.
- 2. Nothing remarkable, however, appeared in Benjamin until he had reached his seventh year. It happened, about this time, that a married sister came to pay a visit to her parents, and brought her infant daughter with her. day, the grandmother having taken the child into the garden, placed her asleep in the cradle, and ordered Benjamin to watch by it. He sat entranced, gazing on her infant beauty, and when she smiled, he seized some paper and pens which lay upon a table close at hand, and endeavoured to trace a likeness of the countenance before him. It would seem that his first rude effort at portrait-taking was not altogether a failure, for when his mother and sister returned, the former exclaimed at once, 'I declare the boy has actually drawn a likeness of our little Sally.' His success gave him confidence in his own abilities, and he immediately offered to make drawings, with his black and red ink, of the different objects in the garden, and especially of the flowers, whose wondrous combinations of colour had already attracted his precocious fancy.

- 3. Delighted to exercise his new-found talent, the boy went on, day after day, designing trees, and flowers, and birds, while the fond father grew more and more confident in the truth of his friend the preacher's predictions. At first, the youthful artist had no other materials with which to work than his pens, and black and red ink, and it is said that, up to this time, he had never seen, in that quiet Quaker household, either painting on canvas or engraving on paper, for illustrated books were not as yet in vogue. He remained ignorant, therefore, of the artist's varied resources of colour, and the means by which gradations of light and shade may be produced, until a party of Indians. visiting Springfield, and admiring his simple delineations, almost as rude and primitive as their own, taught him the method of preparing red and yellow pigments, and his mother enriched him with a piece of indigo. But still he had no brush. A friend, however, informed him that in Europe brushes were made of camels' hair, and West speedily found a substitute for the camel in the household cat, whose tail he ruthlessly robbed for his first brush, and her back for others.
- 4. West was about eight years old when a Mr. Pennington, a Philadelphian merchant, paid his father a visit, and, attracted by the evident merit of the embryo artist's performances, despatched him, upon his return to Philadelphia, a complete assortment of oils, colours, pencils, and brushes, with several pieces of properly-prepared canvas, and a few engravings to serve as copies. 'Benjamin,' we are told, 'was perfectly enraptured. The true nature of the prints he did not suspect at first, the existence of such an art as that of engraving never having entered his imagination. But, of course, he thought them the finest things he had ever seen in his life. During the remainder of the evening he scarcely lifted his eye from his box and its contents. Sometimes he almost doubted that he was actually master of so precious a treasure, and would take it in his hands merely to be assured that it was real. Even after going to sleep, he awoke more than once during the night, and anxiously put out his hand to the box, which he had placed by his

bedside, half afraid that he might find his riches only a dream.'

He awoke the next morning when the sun rose, and, carrying his treasures to the garret, began to work. In this out-of-the-way studio he toiled on, unheeded, day after day, only making his appearance at meal-times, and utterly neglecting his school and its duties. At last his master, surprised at his prolonged absence, called upon his parents to inquire the cause. His mother at once proceeded to the garret, and there discovered the truant and his occupation; but she forgot to reprimand him when she gazed with delight upon the creations of his fertile pencil, and, taking him in her arms, kissed him in all the ecstasy of a mother's love. Out of two of the engravings he had made a composition of his own, colouring it according to his own intuitive feeling of a proper harmony of tints; and his mother, delighted with what he had already accomplished, would not permit him to add another stroke, though the canvas was not half covered.

5. It was soon after this event that Mr. Pennington paid a second visit to Springfield, and, charmed with the progress his young protégé had accomplished, took him back with him to Philadelphia. Here he introduced him to an artist, named Williams, at whose pictures—the first West had ever seen except his own—he gazed in tears. Williams lent him Richardson's Essay on Painting, and Fresnoy's Poem, whose perusal excited in his mind so enthusiastic an affection for his art that, on his return to Springfield, he communicated something of his own impassioned feelings to his schoolfellows, and the whole school went mad with red and yellow ochre. But West was the only one of these young enthusiasts who followed up the art as a serious vocation. With the others it was a passing fancy, whose place was soon usurped by some newer attraction.

West's parents were not rich, and the lad had no money wherewithal to purchase the materials he required. But a neighbour, a cabinetmaker, having given him some smoothed boards, he covered them with sketches in ink, chalk, and charcoal, which attracting the attention of anothex

neighbour, a Mr. Wayne, he purchased them at one dollar apiece. A Dr. Jonathan Morris also gave him a few dollars to buy paints with. These were encouragements so valuable to him at the time, that, in the full glory of his after career, he never forgot the generous donors. formed—this young Springfield student!—the most elevated notions of the honour and dignity of the profession which he had adopted. Neither Titian nor Buonarotti could have gloried more in his art. The preacher's prediction, moreover, was seldom absent from his mind; so that, finding himself, on a holiday occasion, riding the same horse with a schoolfellow, who incautiously let drop, in the course of their conversation, that he was intended to be a tailor, West immediately dismounted, exclaiming that a mere tailor was utterly unworthy of riding with him, who, as a painter, would be the companion of kings and princes! was this remarkable enthusiasm that bore him so happily forward through the discouraging circumstances of his early career, and supported him under every trial, and in the face of every difficulty. It was not, indeed, that he was afflicted with penury, or maddened by want, but that he was constrained to keep alive his love of Art in the uncongenial atmosphere of a Quaker household, and without the help of a competent instructor.

6. West was in his fifteenth year when his drawings attracted the attention of Mr. Flower, a gentleman of refined taste and considerable property, who resided near Lancaster, and invited the young artist to spend a few weeks at his house. This visit was of great advantage to the future painter. From the English governess of Mr. Flower's children, a lady of more than average accomplishments, he gained some knowledge of the history of ancient Rome and Greece, which had previously been to him a terra incognita; and, while residing at Lancaster, he painted the portraits of the wife and daughters of a Mr. Ross, so much to the satisfaction of the good people of Lancaster, that he received as many commissions as he could possibly carry out. He also made the acquaintance of a well-read man named William Henry, who suggested to him the folly of expend-

ing his powers upon so low a branch of his art as portrait painting, and advised him to make an essay at historical composition. He pointed out, as an interesting theme, the Death of Socrates, and read to his friend that touching story, probably from some elementary volume. West was pleased with the suggestion, and proceeded to sketch out his first historical picture.

It was about this time that he made the acquaintance of Dr. Smith, the provost of Philadelphia College, who proceeded to 'cram' him with a superficial, but still useful, knowledge of the rudiments of the Greek and Latin languages and classical mythology. His ardent labour appears to have overwrought his frame, and he was attacked by a severe illness, which confined him for several weeks to his bed. On his recovery he returned to Springfield, and soon afterwards a solemn conclave of his father's Quaker brethren met there to determine his future vocation. A Quaker artist was something of an anomaly; but, on the other hand, there was the lad's own passionate love of Art to be considered, his mother's ambitious hopes, and the preacher's remarkable prophecy. It was, therefore, determined, after much weighty deliberation, that he should be allowed to follow out the bias of his peculiar genius, and, being summoned into the assembly, was set apart, as it were, by a species of religious ceremonial, to the service and worship of Art.

7. Shortly after this remarkable incident he lost his mother, for whom he had cherished a warm affection. When he recovered from the blow, it seemed that the spell which attached him to his father's house was broken, and, proceeding to Philadelphia, he set up there as a portrait painter (August 1756). He resided with a brother-in-law, named Clarkson, and soon obtained sufficient employment. His days he occupied in painting, his evenings in receiving lessons from his old instructor, Dr. Smith. The conviction that his professional education could not be called complete until he had examined the masterpieces of the great European painters animated him in the practice of the most rigid economy, that he might accumulate a sufficient sum to carry him to Rome. Having exhausted the patronage of Philadelphia, he next established himself in New York, where his growing reputation procured him many sitters; and enabled him to double his charges. A Flemish picture which he saw here, of a hermit praying in a lamp-lighted cell, excited in him a desire to paint the same strong contrasts of light and shade, and he chose as a subject a man reading by candle-light. Having received no instruction in the practice of his art, he was at first ignorant of the proper mode of procedure. He surmounted the difficulty by causing his landlord to sit in a darkened closet, looking upon an open book, with a candle near him, while he himself posted his easel in the adjoining room, from which he

could observe his model through a narrow passage.

8. He set out for Italy in 1760, his funds being sensibly increased by a munificent gift of fifty guineas from a Mr. Kelly, whose half-length portrait he had painted. After a brief delay at Leghorn, he pushed on to Rome, receiving letters of introduction from Messrs. Jackson and Rutherford, the correspondents of the owner of the ship which had brought him over. His arrival at Rome (July 10, 1760) produced a signal sensation. Here was a young man from the comparatively unknown region of North America. where, it was popularly supposed, only an imperfect civilisation prevailed, come to study the master-pieces of the great masters, fired by the wild ambition of becoming an artist! Could roses bloom on thistles, or figs grow upon thorn-trees? The English diplomatist, Mr. Robinson. received him with a ready welcome, and took him to an evening party, where he met most of the eminent personages to whom his letters of introduction were addressed. Among these was a well-known connoisseur, Cardinal Albani, who was old and blind, and so ignorant of America and the Americans that he inquired whether West was black or white! Satisfied on the latter point, the old man. who was a craniologist, passed his hands over the artist's head, and remarked that it was excellently formed. next day, when he went to examine some of the art treasures of the city, he was attended by half-a-hundred principal virtuosi, who listened with astonishment to

his racy and original criticisms. On seeing the Apollo Belvidere, the 'god of the unerring bow,' he exclaimed, it is said, 'How like a young Mohawk!'—a greater tribute to the genius of the sculptor of that immortal statue than his padded and periwigged audience were probably aware of!

9. To prove that he had some right to cherish the noble ambition of becoming one of the brotherhood of Art, was West's next attempt, and he persuaded Mr. Robinson to sit to him for his portrait. Mr. Robinson consented, though he was sitting at the same time to the celebrated German artist Mengs. When his portrait was completed he sent it, without revealing the artist's name, to the house of his friend Mr. Crespigné, where an evening party—the élite of Rome—was assembled. It was examined with general admiration, and pronounced by most of the artists present to be the work of Mengs, though it was admitted that he had excelled even himself in the colouring. An English connoisseur, Mr. Dance, however, declared it was not by Mengs; the colouring was superior, he said, to any found in that artist's works, but the drawing was not so good. Mr. Crespigné at last announced—to the universal surprise and astonishment—that the portrait was the work of the young American, Benjamin West. The artist was overwhelmed with congratulations, and Mengs himself was the first to applaud, and, what was better, to counsel.

10. After visiting Florence, Bologna, and Rome—his expenses being met by the liberality of his old Philadelphian patrons—West, in 1763, set out for England, loaded with honours. In London he was introduced to Reynolds and Wilson, to Burke, Garrick, and the leading English literati, receiving from all the kindest encouragement and the most liberal patronage. Abandoning all thoughts of returning to America, he established himself in Bedford Street, Covent Garden, and devoted himself to the assiduous practice of his profession. Through the Archbishop of York he obtained an introduction to the royal closet, and was soon distinguished by George III. with special favour. His admirable pictures of 'The Death of General Wolfe'—

by which he is best known to posterity—of 'Death on the Pale Horse,' and 'Christ healing the Sick,' raised him to the highest place among the historical painters of his day. In 1791, he was elected President of the Royal Academy, a post he occupied, with the exception of a short interval, until his death, in 1820.

11. To the last he continued a hard worker. He rose early, and devoted the morning, before breakfast, and the evening, after dinner, to the study of the subjects on which he was engaged. The interval, or from ten to four, he occupied at his easel. Thus, he was enabled to produce, in oil alone, upwards of four hundred pictures, many of them of a colossal size. He was not a man of genius; and the success he attained is a remarkable proof of what may be effected by persons of ordinary powers, if they concentrate all their energies upon one particular pursuit. As Beethoven said, 'The barriers were never raised which could say to aspiring talents and persistent industry, "Thus far, and no farther." Or, to quote the admirable advice of Goldsmith, 'People may tell you of your being unfit for some peculiar occupations in life; but heed them not. Whatever employ you follow with perseverance and assiduity will be found fit for you; it will be your support in youth, and comfort in age. In learning the useful part of any profession, very moderate abilities will sufficegreat abilities are generally injurious to the possessors. Life has been compared to a race; but the allusion still improves by observing that the most fit are ever the most apt to stray from the course.'

EPILOGUE.

1. When Richard Burke was found, after one of his brother Edmund's most brilliant orations, absorbed in thought, a friend inquired the cause. He replied, 'I have been wondering how Ned has contrived to monopolise all the talents of the family; but then, again, I remember, when we were at play, he was always at work.' And out work, genius, as in the case of Edgar Allan Poc.

will accomplish little; will leave only dazzling fragments, the disjecta membra of some grand conception for posterity to mourn over 'what might have been.' There is no better substitute for extraordinary talents than extraordinary industry, and nothing more commendable than the cultivation—true, honest, and zealous—of inferior natural

powers.

2. We might multiply examples of the devotedness with which all great artists have adhered to the profession they have adopted, and how they have subordinated all things to the necessity of attaining excellence in one special pursuit. Choose your aim, and go straight to it, as the bullet to its mark: this is the lesson which is read by the lives of all illustrious men. The father of William Etty the painter was a manufacturer of gingerbread and spice nuts, and though his son evinced an early predisposition to Art, he apprenticed him to a printer. But the boy had fixed his soul on becoming an artist, and occupied every leisure moment in learning to paint and draw. When out of his apprenticeship he was enabled to enter the Royal Academy, and by dint of sheer industry, hard work, unremitting labour, rose to a position of distinguished repute among English painters.

3. When the elder brother of Sebastian Bach wished to divert the young student from his musical studies, he deprived him of a candle, but the boy went on working by moonlight. Sir Thomas Lawrence was the son of a Bristol inkeeper, and began to use his pencil when four or five yearsold. He enjoyed but two years' instruction at school, but the power of work which he possessed enabled him to supply every deficiency, and conquer every obstacle. While a resident at Bath, he was employed in portrait painting at least four hours daily; the remainder of his time he devoted to studies and voluntary exercises connected with his beloved art. This is the spirit in which every man must labour who seeks to rise above his fellows;—he

must make of life one long apprenticeship.

4. A remarkable instance we may borrow from foreign biography, when it treats of the career of the great Italian

sculptor, Antonio Canova. He was born in 1757, at the little village of Passagno, in the Venetian territory. His father, a stonecutter, died when he was only two years old. and his mother, speedily re-marrying, abandoned him to the care of his father's parents, who, it is but justice to state, tended him with the most anxious solicitude. His grandfather was a stonecutter, and a man of more than ordinary intelligence, and he delighted to have his little grandchild constantly with him, to teach him the elements of drawing, and something of the art of modelling in clay. As early as his ninth year he displayed so much ability that his grandfather employed him regularly as a workman. and he continued at his work until he was twelve years old. when the proprietor of the village, a member of the Falieri family, having remarked his indications of superior capacity, generously placed him under the eminent Venetian sculptor, Giuseppe Toretto. After he had laboured in that master's atelier for about a twelvementh, he seized the opportunity of his master's absence to model two figures of angels in clay. Toretto, on his return, was surprised at their perfection, and enlarged the course of instruction which he had previously considered sufficient.

5. When Canova had attained his sixteenth year his munificent patron sent for him to Venice, and placed at his disposal the means of adopting the profession of an artist. But that he might not altogether be dependent on the generosity of Falieri, although he lived in his palace, Canova engaged himself in the afternoons to assist a Venetian sculptor. 'I laboured,' he says, 'for a mere pittance, but I thought it sufficient. It was the fruit of my own resolution, and, as I then flattered myself, the foretaste of more honourable rewards; for I never thought of wealth.' His mornings were devoted to study in the Academy or the galleries, his afternoons to the sculptor's workshop, his evenings to the acquisition of general knowledge. At length he obtained a commission from a Venetian signor for two baskets, containing fruit and flowers, in marble, but it gave little indication of the genius he afterwards displayed. More study and more

work were needful; and the sculptor accordingly withdrew from his patron's palace, and set up a small studio in a ground cell of the monastery of the Augustine Friars, the use of which was allowed him by the fraternity. Here he toiled for four obscure and profitless years, labouring hard at the study of nature as introductory to the practice of art. When he wished to learn anatomy he attended the public spectacles and theatres, and noted the attitudes and gestures of the living figure. He laid it down as an unalterable rule that every day he should complete a design, or make one step in advance. Nulla dies sine lined. And sedulously did he devote himself to the study of literature—of poetry, history, and the classics—as calculated to enrich his imagination and refine his taste as an artist.

6. He first rose into repute on the completion of his group of 'Orfeo è Euridice,' exhibited in 1776. Commissions now poured in upon him, and in 1780, the Venetian senate gifted him with an annual pension of 300 ducats (about 60l.) in order that he might prosecute his studies awhile at Rome. In that famous city of the Arts he finally took up his abode, gradually rising into estimation as the foremost sculptor of his age and nation. The Emperor Napoleon fully appreciated his genius, and from almost every crowned head in Europe he received commissions; while in England his works have always been sought after with the utmost avidity. After a career of triumphant success, and a life of unblemished virtue, the great sculptor died in 1822, aged 65, leaving behind him a memorable example of the success with which well-directed labour is always attended.

CHAPTER IV.

EXAMPLES AND ENCOURAGEMENTS FROM THE LIVES OF EMINENT MEN OF LETTERS.

How dull it is to pause, to make an end,
To rust unburnish'd, not to shine in use!
As tho' to breathe were life.
Some work of noble note may yet be done.

TENNYSON

1. It is observable that many of our most illustrious men have failed at first in those very pursuits in which they have afterwards gained a triumphant reputation. They have not suffered themselves, however, to be discouraged. but redoubled their efforts until the light of success has shone full upon their paths. C'est des difficultés qui naissent les miracles. Bulwer Lytton's first novel was a failure. and afforded little indication of the genius which in the fulness of time was to give birth to 'The Caxtons.' poem was a failure, and so was his first drama. But he worked on, undismayed, inspirited, in fact, by the very difficulties which would have overthrown weaker minds. and became the first novelist of the day, a successful dramatist, a distinguished statesman, and a poet of no mean order. Disraeli's first speech in the House of Commons was received with shouts of laughter and bursts of ironical cheering. These did not daunt him. He exclaimed, 'The time will come when you shall hear me,' and he took care to ensure the fulfilment of his own prophecy. Curran, the great Irish orator, when a youth, stuttered terribly. He

joined a debating club, but found himself unable to give expression to his thoughts. One day, however, an opponent characterised him as 'Orator Mum.' Stung by the sneer, he sprang to his feet, and poured forth a torrent of impassioned eloquence. Gaining confidence in his own powers, he now set himself to work to conquer his defective articulation by reading aloud, slowly, distinctly, and emphatically, for several hours daily, and correcting his gestures and attitudes by practice before a mirror. The result was, that the stuttering youth became one of the most famous of the famous orators of Ireland—a country always rich in men of eloquent utterance.

- 2. Poverty has never been accepted by the earnest student as an argument for despondency. He who throws down his weapons in the heat of the battle, will hardly live to join in the last triumphant charge. The ardent seeker after knowledge suffers neither want nor penury to dispirit him. Ferguson, the shepherd-boy, wrapped his plaid around him, as he lay out on the wintry moorland, and observed the places of the stars by means of a thread on which he had strung a few glass beads. Dr. Alexander Murray, the eminent Orientalist, learned to write with the black end of a charred heather root on the board of an old wool-card. As he advanced in years his desire for knowledge became insatiable. He taught himself French, and Latin, and Greek, and Hebrew, supporting himself, meanwhile, by teaching, and earning sometimes as much as forty shillings in a whole winter. His wonderful career was terminated at the early age of 38, but before his death there was scarcely one of the oriental or northern languages with which he was not familiar!
- 3. Knowledge, to the true student, brings its own sweet recompense, and he will not appraise his gains by the huckstering estimate which the world is so fond of forming. As Robert Nicoll, the poet, wrote, he will feel that, whether he be growing richer or not, he is growing a wiser man, which is far better. 'Pain, poverty, and all the other wild beasts of life which so affrighten others, I am so bold,' writes the brave Scotch lyrist, 'as to think I could look in the

face without shrinking, without losing respect for myself. faith in man's high destinies, or trust in God.' To industry it cannot be difficult to attain a lofty eminence in letters, inasmuch as for industry rather than genius does knowledge bridge the depths which roll between the world and her enchanted land. Only be in earnest; only be resolute of will. and fixed in purpose; only cleave to your determination with all your heart and soul, and the wide circle of human science. the vast field of ancient and modern learning, lies at your command. You must need no royal road to knowledge. When William Cobbett learned grammar, he was a private soldier, receiving sixpence a day. 'The edge of my berth,' he writes, 'or that of my guard bed, was my seat to study in; my knapsack was my book-case; a bit of board lying on my lap was my writing-table; and the task did not demand anything like a year of my life. I had no money to purchase candle or oil; in winter it was rarely that I could get any evening light but that of the fire, and only my turn even of that.' When the great Erasmus was a poor student at Paris, without a sufficiency of food or clothing, he could still write to a friend, 'As soon as I get money I will buy. first'—what? raiment or provisions?—'first, Greek books and then clothes.' Winkelman, the German writer upon art, while attending the grammar-school, earned his living by singing at night in the streets. Dr. Johnson, at the outset of his career, endured poverty and hunger uncomplainingly, picking up a dinner at a sixpenny ordinary. sleeping under any shelter he could procure, but still pursuing knowledge with a devotion which nothing could weaken. Lagrange, who translated Lucretius into French. was so poor, when a student at the University, that a little dry bread was all his food for the day. Prescott, the admirable American historian, contended, and successfully. with even a greater difficulty-blindness. He relates his sad experiences in his preface to the 'Conquest of Peru:'-'While at the University,' he says, 'I received an injury in one of my eyes, which deprived me of the sight of it. The other soon after was attacked by inflammation so severely that for some time I lost the sight of that also; and. though it was subsequently restored, the organ was so much disordered as to remain permanently debilitated; while, twice in my life, I have been deprived of the use of it for all purposes of reading and writing for several years together. It was during one of these periods that I received from Madrid the materials for the "History of Ferdinand and Isabella;" and in my disabled condition, with my transatlantic treasures lying around me, I was like one pining from hunger in the midst of abundance. In this state, I resolved to make the ear, if possible, do the work of the eye. I procured the services of a secretary, who read to me the various authorities; and in time I became so far familiar with the sounds of the different foreign languages (to some of which, indeed, I had been previously accustomed by a residence abroad) that I could comprehend his reading without much difficulty. As the reading proceeded, I dictated copious notes; and, when these had swelled to a considerable amount, they were read to me repeatedly, till I had mastered their contents sufficiently for the purposes of composition. The same notes furnished an easy means of reference to sustain the text. Still, another difficulty occurred in the mechanical labour of writing, which I found a severe trial to the eye. This was remedied by means of a writingcase, such as is used by the blind; which enabled me to commit my thoughts to paper without the aid of sight, serving me equally well in the dark as in the light.'

Such is the influence of work and purpose! And thus it is that a felicitous result is always attained by him who concentrates his powers upon a particular pursuit, and carries out his design with unflinching resolution and

unremitting industry.

EXAMPLES.

CHARLOTTE BRONTË.

1. Or the truth of the trite maxim we have just enunciated it would be difficult to find, in the annals of literature, a more powerful illustration than the author of 'Jane

Eyre,' who emerged from the solitude of a bleak Yorkshire parsonage to astonish the world with the lustre of her

genius and the rapid growth of her celebrity.

Charlotte Brontë was born at Thornton, in Yorkshire. on April 21, 1816. The ill-health of her mother, and the peculiar educational notions cherished by her father. rendered her childhood a remarkable one-singularly quiet and lonely, and tending to the formation of meditative habits, and the nurture, perhaps, of strange and ideal fancies. The mother died when Charlotte was but five years old, and the Brontë-household grew quieter and lonelier than ever. They had few acquaintances and fewer friends, and their hours were spent in poring over whatever books fell within their reach, or in the indulgence of daydreams and visions of the most romantic character. these Brontës were endowed with mental powers of no ordinary calibre, and Charlotte especially displayed a keen rare intellect and fertile imagination. 'When mere children, writes her father, 'as soon as they could read and write. Charlotte and her brothers and sisters used to invent and act little plays of their own, in which the Duke of Wellington, my daughter Charlotte's hero, was sure to come off conqueror; when a dispute would not unfrequently arise amongst them regarding the comparative merits of him, Buonaparte, Hannibal, and Cæsar. When the argument got warm, and rose to its height, as their mother was then dead, I had sometimes to come in as arbitrator, and settle the dispute according to the best of my judgment. Generally, in the management of these concerns, I frequently thought that I discovered signs of rising talent, which I had seldom or never before seen in any of their age. . . . A circumstance now occurs to my mind which I may as well mention. When my children were very young-when, as far as I can remember, the oldest was about ten years of age, and the youngest about fourthinking they knew more than I had yet discovered, in order to make them speak with less timidity, I deemed that if they were put under a sort of cover I might gain my end; and happening to have a mask in the house, I told them all to stand and speak boldly from under cover of the mask.

'I began with the youngest (Anne), and asked what a child like her most wanted; she answered, "Age and experience." I asked the next (Emily) what I had best to do with her brother Branwell, who was sometimes a naughty boy; she answered, "Reason with him, and when he won't listen to reason, whip him." I asked Branwell what was the best way of knowing the difference between the intellects of man and woman; he answered, "By considering the difference between them as to their bodies." I then asked Charlotte what was the best book in the world: she answered, "The Bible." And what was the next best; she answered, "The Book of Nature." I then asked the next what was the best mode of education for a woman; she answered, "That which would make her rule her house well." Lastly, I asked the oldest what was the best method of spending time; she answered, "By laying it out in preparation for a happy eternity." I may not have given precisely their words, but I have nearly done so, as they made a deep and lasting impression on my memory.'

An eëry household this, where the father could propound to his children such difficult theses, and those children, under the naïve cover of a mask, resolve them in a manner so remarkable!

2. A gleam of feminine life was flung into this singular family by the arrival, about a year after Mrs. Bronte's death, of her elder sister, Miss Branwell, 'a kindly and conscientious woman, with a good deal of character.' All she appears to have done for her nicces, however, was to teach them sewing, and initiate them into the mysteries of household management. Their education they still continued to receive from their father, who, previous to this occurrence, had been transferred to the vicarage of Haworth—a wild, lonesome village, among the Yorkshire hills.

3. In September 1824, Charlotte Brontë was despatched to Cowan Bridge, a school for the daughters of poor clergymen, whither her sisters Maria and Elizabeth had preceded her in July. The discipline adopted here was

unnecessarily rigid; the diet and the domestic arrangements were framed on a scale of the meanest parsimony; and no establishment could be less fitted for the nurture of tender and delicate young girls. The results were, the sickness unto death of Maria Brontë, and the scathing exposure which lives in the immortal pages of 'Jane Eyre'—a picture which, for force, vigour, and reality, equals, if it does not surpass, the famous drawing of Dotheboys Hall, in 'Nicholas Nickleby.'

The children returned to Haworth in the autumn of 1825, soon after Charlotte had completed her ninth year. They resumed their singular course of home instruction. their father frequently discussing with them the public topics of the day; until they took a real and vivid interest in politics and politicians, the cabals of courts and the intrigues of ministers. Charlotte's longing after knowledge grew daily more enthusiastic, and her literary tendencies developed themselves more distinctly. Mrs. Gaskell has preserved a catalogue of the compositions she wrote up to August 3, 1830, that is, up to her fifteenth year, and an extraordinary list it is. We read of 'Two Romantic Tales. in one volume;' 'The Search after Happiness, a Tale; 'The Adventures of Ernest Alembert, a Tale;' 'Tales of the Islanders, in four volumes,' in which the late Duke of Wellington and his sons figure as the heroes; the 'Young Men's Magazine, in six numbers; 'The Poetaster, a Drama,' &c., making in the whole one and twenty volumes. Not only in quantity, but in quality, these productions were of no ordinary character, and powerfully illustrate the industry, perseverance, and force of mind of Charlotte Brontë. When scarcely thirteen, this strange eëry child, brought up in the solitude of a sequestered Yorkshire parsonage, thus enumerates the painters whose works she desires to see-' Guido Reni, Julio Romano, Titian, Raphael, Michael Angelo, Correggio, Annibal Caracci, Leonardo da Vinci, Fra Bartolomeo, Carlo Cignani, Vandyke, Rubens. Bartolomeo Ramerghi,' many of them artists whose names are not familiar to persons of far showier accomplishments. even in maturer age.

- 4. Mrs. Gaskell affords us a vivid portraiture of Miss Brontë, which our young readers will probably peruse with satisfaction. 'In 1831,' she says, 'she was a quiet, thoughtful girl, of nearly fifteen years of age, very small in figure -"stunted" was the word she applied to herself-but as her limbs and head were in just proportion to the slight, fragile body, no word in ever so slight a degree suggestive of deformity could properly be applied to her; with soft, thick, brown hair, and peculiar eyes, of which I find it difficult to give a description, as they appeared to me in her later life. They were large and well-shaped; their colour a reddish brown; but if the iris were closely examined, it appeared to be composed of a great variety of tints. The usual expression was of quiet, listening intelligence; but now and then, on some just occasion for vivid interest or wholesome indignation, a light would shine out, as if some spiritual lamp had been kindled, which glowed behind those expressive orbs. I never saw the like in any other human creature. As for the rest of her features, they were plain, large, and ill-set; but, unless you began to catalogue them, you were hardly aware of the fact, for the eyes and power of the countenance overbalanced every physical defect; the crooked mouth and the large nose were forgotten, and the whole face arrested the attention, and presently attracted all those whom she herself would have cared to attract. The hands and feet were the smallest I ever saw; when one of the former was placed in mine, it was like the soft touch of a bird in the middle of my palm. The delicate long fingers had a peculiar fineness of sensation, which was one reason why all her handiwork, of whatever kind-writing, sewing, knitting—was so clear in its minuteness. She was remarkably neat in her whole personal attire; but she was dainty as to the fit of her shoes and gloves.'
- 5. We select another picture of her ways of life and peculiarities of thought, when a pupil, in 1831, of a Miss W., who lived at Roe Head, near Leeds. It is sketched by one of her schoolfellows:—'She would confound us by knowing things that were out of our range altogether. She

was acquainted with most of the short pieces of poetry that we had to learn by heart; would tell us the authors, the poems they were taken from, and sometimes repeat a page or two, and tell us the plot. She had a habit of writing in italics (printing characters), and said she had learnt it by writing in their magazine. They brought out a "magazine" once a month, and wished it to look as like print as possible. She told us a tale out of it. No one wrote in it, and no one read it, but herself, her brother, and two sisters. In our play-hours she sat or stood still, with a book, if possible. Some of us once urged her to be on our side in a game at ball. She said she had never played, and could not play. We made her try, but soon found that she could not see the ball, so we put her out. She took all our proceedings with pliable indifference, and always seemed to need a previous resolution to say "No" to anything. used to go and stand under the trees in the playground. and say it was pleasanter. She endeavoured to explain this, pointing out the shadows, the peeps of sky, &c. understood but little of it. She said that at Cowan Bridge she used to stand in the burn, on a stone, to watch the water flow by. I told her she should have gone fishing; she said she never wanted. She always showed physical feebleness in everything. She used to draw much better and more quickly than anything we had seen before, and knew much about celebrated pictures and painters. At school she had no plan of life beyond what circumstances made for her. She knew that she must provide for herself, and chose her trade; at least she chose to begin it at once. Her idea of self-improvement ruled her even at school. It was to cultivate her tastes. She always said there was enough of hard practicality and useful knowledge forced on us by necessity, and that the thing most needed was to soften and refine our minds. picked up every scrap of information concerning painting, sculpture, poetry, music, &c., as if it were gold. Thus she continued 'an indefatigable student,' occupying every available minute in reading and writing; and entertaining such a conviction of the value of education and the

power of knowledge as is rarely found in a school-girl of fifteen.

6. Miss Brontë left Roe Head in 1832, having secured the attachment and respect of her teacher and her schoolfellows, and formed some pleasant intimacies which, in later life, ripened into enduring friendships. At Haworth she resumed her usual habits—educating herself by the constant perusal of good books, and taking long walks into the depths of the picturesque Yorkish scenery, whose wild and striking landscapes she afterwards reproduced with such graphic power in the pages of 'Shirley' and 'Jane Eyre.' From this monotonous life, however, which could never have educed all the remarkable faculties of her comprehensive intellect, she was rescued in July 1835, when she returned to the school at Roe Head as a teacher. She remained there, happy and tranquil, until 1839. Meanwhile, half diffident of her own powers, and yet stirred by a perpetual longing to give expression to her thoughts in words, she addressed herself to the poet Southey, entreating his sincere and frank opinion, and enclosing specimens of her compositions. He replied in a letter instinct with admirable feeling and genial sympathy. 'Do not suppose,' he wrote, 'that I disparage the gift which you possess; nor that I would discourage you from exercising it. I only exhort you so to think of it, and so to use it, as to render it conducive to your own permanent good. Write poetry for its own sake, not in a spirit of emulation, and not with a view to celebrity; the less you aim at, the more likely you will be to deserve, and finally to obtain it. written, it is wholesome both for the heart and soul; it may be made the surest means, next to religion, of soothing the mind and elevating it. You may embody in it your best thoughts and your wisest feelings, and in so doing discipline and strengthen them.'

Early in 1839, she became private governess in one of those well-to-do but low class families, where the person to whom the intellectual culture and moral guidance of their children is entrusted, ranks, nevertheless, but as an upper servant! One of her pupils, whose heart she had won by her patience, firmness, and kindly feelings, said one day, in a sudden outburst of emotion, 'I love 'ou, Miss Bronte.' Whereupon the wise mother exclaimed, with a supercilious shudder, 'Love the governess, my dear!' The governess. indeed! A woman of mind, heart, and fancy; of great attainments and many accomplishments; to whom I make over the education of my sons and daughters, to discipline their imaginations and form their characters; but whom I reward with a salary inferior to my butler's wages! . . . Love the governess? No wonder Miss Brontë's employer was smitten with a shock of virtuous indignation; and no wonder that Miss Brontë should write—'I used to think I should like to be in the stir of grand folks' society, but I have had enough of it—it is dreary work to look on and listen. I see more clearly than I have ever done before. that a private governess has no existence, is not considered as a living rational being, except as connected with the wearisome duties she has to fulfil.'

7. Her engagement in this harsh cold family terminated in July, but not before her health had been seriously affected by the constant strain upon her spirits and strength. It revived under the influence of a visit to the sea-side in the following September—a visit which made a vivid and permanent impression on her mind. During 1840, her life passed at Haworth in the usual routine, except that a shadow was cast over the quiet household by the misconduct of Branwell Brontë. She occupied herself in studying French and German; a yearning after fame. and a desire to qualify herself for a literary life, being still active at her heart, though, perhaps, almost unknown to herself. Early in March 1841, she again, and for the last time. essayed a governess's career, and with more success than in her previous venture. Her new employers appreciated her talents and her desire to please, and treated her with a consideration which in after life she was always ready to acknowledge. When they parted at Christmas, the regret was mutual, nor did it arise from any dissatisfaction with her treatment or her duties, but Charlotte was now about to carry out a project which she had long cherished with

concealed eagerness—to complete her education abroad. She concluded an agreement with Monsieur and Madame Héger, of Brussels, and to their pensionnat she proceeded. accompanied by her sister Emily, early in 1842; and set herself, with characteristic resolution, to obtain a thorough acquaintance with the French language and literature. They were fortunate in their instructor. Monsieur Héger was a man of considerable abilities, and well-informed in the subjects he professed to teach. He was pleased with his pupils, and they with him. The result was visible in the extraordinary command over expression in French, and the remarkable power of thinking in French, which they rapidly attained. During the latter period of their stay at the pensionnat they paid nothing, giving, in return for the advantages they enjoyed, their services as English and music teachers. The death of their aunt, Miss Branwell, recalled them for awhile to England in October 1842; but Charlotte again repaired to Brussels, and continued there her double duties as teacher and learner, until the close of the year 1843.

8. She arrived at Haworth on January 2, 1844, and this strange Brontë family once more enjoyed the delights of mutual intercourse. But a dark dull cloud was rapidly gathering over them. Branwell, once the pride and hope of the household, was gradually sinking into the depths of moral degradation. Her father's partial blindness was growing worse, and she herself was reflecting that she was nearly thirty, and had done nothing yet. But the brave heart and the strong intellect still kept on their silent uncomplaining course, waiting, with a sublime patience, for the sunrise to break upon the shadowy hills.

The autumn of 1845 was lightened, indeed, by a new source of interest—the discovery of Emily Bronte's remarkable poetical powers. The three sisters then took counsel with each other—Charlotte, Emily, and Anne—and, at length, determined upon the bold undertaking of printing a small selection of their poems, veiling their identity under the pseudonyms of Currer, Ellis, and Acton Bell. The volume was printed at their own expense, and published by Messra.

Aylott & Jones, of Paternoster Row. The winter of 1845 and the spring of 1846 were occupied with the necessary preparatory arrangements; and, about the end of May, the small, thin, precious volume 'stole into life.' At first, the busy reading world made no sign, and seemed unconscious that a book of true and original poetry was quietly awaiting its supercilious notice. Nor, save an appreciative criticism in the Athenœum, did it attract much attention from press

or public until after the success of 'Jane Eyre.'

9. That wonderful book she began in August 1846, at Manchester, whither she had accompanied her father, upon whose eyes Mr. Wilson, an eminent oculist, was about to operate for cataract. The operation proved successful, and Mr. Brontë's eyesight gradually improved. The twain having again returned to Haworth, Charlotte endeavoured to find a publisher for her first novel, 'The Professor.' went from firm to firm unsuccessfully, until it reached the hands of Messrs. Smith & Elder. By them it was rejected on account of its want of sustained interest, but they intimated that a three-volume novel from the same pen would meet with every attention. Hope deferred, it is said, makes the heart sick; but Currer Bell's genius was not of the sort which discouragement causes to relax in its efforts. While 'The Professor' was plodding his weary round, the romance of 'Jane Eyre' was steadily approaching completion. was finished in August 1847; was duly taken into consideration by Messrs. Smith, Elder, & Co.; and printed and published by the 16th of October.

10. It was said of Byron, after the publication of his great poem, that he 'awoke one morning and found himself famous.' The same cannot be said of Charlotte Brontë, for the progress of 'Jane Eyre' with the public was slow but certain. By the close of the year, however, its extraordinary power and pathos had taken that strong hold of the reading world which they have ever since retained; and judicious critics were fain to admit that the new star which had risen so quietly above the horizon was one of surpassing lustre. A second edition was called for in January 1848, and appeared with a characteristic dedication to the great

novelist whom she so enthusiastically admired—the creator of 'The Newcomes.' Conjecture ran wild in literary circles as to the identity of the author of a work so original; for not even the publishers were aware that Currer Bell was

the pseudonym of Charlotte Brontë.

11. But, while thus revelling in the first warm flush of fame, and in the sweet consciousness that she had not overrated her powers, the quiet Haworth home was blackened with desolation by her unworthy and unhappy brother. Upon a tale so melancholy, however, we will not dwell. Enough to say that he died, most miserably, in September, 1848. She next paid a visit to London, and revealed herself to her astonished publishers—this quiet, little, unassuming Yorkshire lady—as the author of the strong, masculine, and passionate fiction of 'Jane Eyre.' The close of the year was darkened by an affliction even more grievous than her brother's loss—the death of her sister Emily, a woman of rare mental power, on the 19th of December. It was closely followed by the death of the gentle Anne, on the 28th of May, in the following year.

12. 'Shirley,' her second novel in point of publication, appeared in October 1849, and confirmed and deepened the impression made by its predecessor. There could be no question now as to its author's wonderful genius, her power of analysing character, her felicitous language, her grasp of thought and feeling, and keen relish for the beauties of nature. Her third novel, 'Villette,' placed her at the head of living female novelists. It has less interest as a story than 'Jane Eyre,' but is a work of infinitely greater

genius.

Here we conclude our brief sketch of a noble life. Charlotte Brontë married, on June 29, 1854, her father's curate, the Rev. A. B. Nicholls. But the same fate that had attended her sisters brooded over her as she stood at the altar, vowing her vows of love and duty. enjoyed but nine months of married happiness, dying at the

early age of 39, on March 31, 1855.

ROBERT SOUTHEY.

- 1. This eminent and most laborious man of letters. whose life was one long devotion to knowledge, one earnest attachment to the profession which his genius illustrated and his virtues dignified, was born in Wine Street. Bristol, on August 12, 1774. His father, a draper, had in his youth been much addicted to the pastime of coursing, and therefore chose to distinguish his shop by the sign of a hare. It is now known as the 'Golden Key.' When a mere child, Robert Southey was sent to a day-school, kept by a Mrs. Powell, but he could have remained there only a week or two, as, from the age of two years to six, he resided under his aunt's roof at Bath. On his return to Bristol, he was despatched to an academy, kept by Mr. Foot, a dissenting minister, who treated him with unreasonable harshness; in this respect setting an example which his schoolfellows were not slow to follow. Thence he was removed to a boarding-school at Corston, about nine miles from Bristol: an old country mansion, encircled with meadows, gardens, and paddocks, where, however, disorder reigned paramount, and no system of instruction appears to have found a place.
- 2. After a pleasant interval spent under his grand-mother's roof at Bedminster, he was despatched as a day-boarder to a school kept by a Welshman named William Williams. Here he remained between four and five years, and made considerable progress in his studies. His love of knowledge had already begun to display itself; and his friends formed so high an opinion of his capacity, that, when in his fifteenth year, he was placed at Westminster School (Feb. 1788). He rapidly rose to the upper classes, distinguishing himself by his powers of composition and love of poetry; but, having published a satirical periodical called the Flagellant, in which he reflected severely on the flogging propensities of the head master, Dr. Vincent, he was summarily expelled. He had shown, however, such decided indications of ability, that his uncle, the Rev.

Herbert Hall, came forward to his assistance, and entered him at Balliol College, Oxford.

- 3. At the age of nineteen, he first appeared before the reading world as a poet. This venture was an epical composition, of fierce republican tendencies, entitled 'Joan of Arc,' displaying much vigour of style, fertility of fancy, and grace of sentiment. It was favourably received by a portion of the public. About the same time he wrote a yet wilder and far inferior poem, on the suggestive theme of 'Wat Tyler.' Long afterwards, when his reputation was established, and he professed political principles of a most Conservative hue, a cunning bookseller surreptitiously published the republican rhapsody, much to his own profit, and Southey's natural indignation.
- 4. In 1794, he became acquainted with Coleridge, then an undergraduate of Jesus College, Cambridge, and joined him in his mad scheme of a Pantisocracy—i.e. a system of life in which every one was to be equal. Land was to be purchased on the banks of the Susquehanna, and brought into cultivation by the hands of the Pantisocratists. All were to be married, and on their wives were to devolve the domestic duties. The chief actors were Southey, Coleridge, and Lovell; their partners were to be the three Misses Fricker, of Bristol. The marriages, indeed, took place; but every other part of the scheme was rudely shattered by the indignation of Southey's aunt, Miss Tyler, to whom it had happened to become known.

Southey now accompanied his maternal uncle, who was chaplain to the English Factory at Lisbon, to Portugal. He had only just been married, and had parted from his wife at the portico of the church where the marriage was celebrated. He remained at Lisbon six months. On his return to England in 1796, he entered himself at Gray's Inn, and regularly adopted literature as a profession. Henceforth he laboured with an assiduity of which literary history presents few parallel examples. Every hour had its allotted task; and so vast and varied was the knowledge he had acquired, that he could write with facility, and with

success, on almost every subject—history, morals, divinity,

law, or poetry.

5. In 1797, he published his 'Minor Poems;' in 1799-1800, his 'Annual Mythology;' 'Thalaba' appeared in 1801; 'Amadis of Gaul,' in 1803; 'Madoc,' 'Espriella's Letters,' and 'Specimens of Later Poets,' 1807; 'Curse of Kchama,' 1810; 'Life of Nelson,' 1812; 'Roderick, the Last of the Goths,' 1814. And so he continued, year after year, to pour out volume upon volume, on almost every imaginable theme, and written in English of marvellous purity and beauty. Having become a Conservative of the strictest faith, he was rewarded, in 1813, with the poetlaureateship, whose annual salary was an agreeable addition to his income. But his works, and his contributions to the Quarterly Review, brought him yearly a remuneration which placed him beyond the reach of want, and enabled him to settle down at Keswick in the midst of his books and papers with comparative ease.

6. He gives this account of his daily labours in a letter to a friend:—'I get out of bed as the clock strikes six. and shut the house-door after me as the clock strikes seven. After two hours with Davies (arranging Dr. Bell's papers), home to breakfast; after which Cuthbert (his son) engages me till about half-past ten; and then the post brings me letters that either interest or trouble me (for of the latter I have many); by eleven I have done with the newspaper, and can then set about what is properly the business of the day. At two I take my daily walk, be the weather what it may, and, when the weather permits, with a book in my hand; dinner at four; work about half an hour; then take the sofa with a different book, and, after a few pages, get my soundest sleep, till summoned to tea at six. My best time during the winter is by candlelight; but in the season of company I can never count upon an evening's work. Supper at halfpast nine, after which I work an hour, and then to bed.'

7. This ccaseless labour proved too much, however, for Southey's mind. It gave way, and he sank into hopeless imbecility. During his declining years he was tenderly nursed by his second wife, Caroline Bowles, herself

a poetess of no mean order, and he died, tranquilly and without pain, on March 26, 1843, in the sixty-ninth year of his age. He left behind him, as the result of his literary toil, a fortune of 12,000l.

8. His friend and fellow-labourer, the poet Wordsworth, has consecrated his memory in some graceful lines:

Ye torrents foaming down the rocky steeps, Ye lakes wherein the Spirit of Water sleeps, Ye vales and hills, whose beauty hither drew The poet's steps, and fixed him here, on you His eyes have closed; and ye, loved brooks, no more Shall Southey feed upon your precious lore, To works that ne'er shall forfeit their renown, Adding immortal labours of his own. Whether he traced historic truth with zeal For the State's guidance or the Church's weal; Or Fancy, disciplined by studious Art, Informed his pen, or wisdom of the heart, Or judgments sanctioned in the patriot's mind By reverence for the rights of all mankind; Large were his aims, yet in no human breast Could private feelings find a holier rest. His joys, his griefs, have vanish'd like a cloud From Skiddaw's top; but he to Heaven was vow'd Through a long life, and calm'd by Christian faith In his pure soul the fear of change and death.

Southey was a remarkable instance of love of knowledge. He loved it for its own sake, and refused dignities and titles if they were likely to draw him away from his beloved books. He lived for his profession, and devoted to it every faculty of his brain. Hence he has won for himself a name and a memory which England will not willingly let die.

DR. ALEXANDER MURRAY.

1. This illustrious Oriental scholar was born at Minnigaff, in the county of Kirkcudbright, on October 22, 1775. His father, a shepherd, was almost a septuagenarian at the time of his son's birth, but he lived to see him reach the age of twenty-two, and is described as having himself been a man of much natural capacity and of no inconsiderable.

knowledge. He taught his son to read in a manner which strikingly shows how necessity will conquer difficulties. Having bought him a catechism to which was prefixed a copy of the alphabet printed in large type, he drew, throughout the winter evenings, the figures of the letters for his son, in his written hand, on the back of an old wool-card, with the black end of an extinguished heather stem or root, snatched from the fire. 'I soon learned all the alphabet in this form,' writes Dr. Murray, 'and became writer as well as reader. I wrought with the board and brand continually. Then the catechism was presented, and in a month or two I could read the easier parts of it. I daily amused myself with copying, as above, the printed letters. In May 1782, he gave me a small psalm-book, for which I totally abandoned the catechism, which I did not like, and which I tore in two pieces, and concealed in a hole of a dyke. I soon got many psalms by memory, and longed for a new book. Here difficulties arose. The Bible, used every night in the family, I was not permitted to open or touch. The rest of the books were put up in chests. I at length got a New Testament, and read the historical parts with great curiosity and ardour. But I longed to read the Bible, which seemed to me a much more pleasant book; and I actually went to where I knew an old loose-leaved Bible lay, and carried it away in piecemeal. I perfectly remember the strange pleasure I felt in reading the histories of Abraham and David. I liked mournful narratives; and greatly admired 7eremiah, Ezekiel, and the Lamentations. I pored on these pieces of the Bible in secret for many months, but I durst not show them openly; and, as I read constantly and remembered well, I soon astonished all our honest neighbours with the large passages of Scripture I repeated before them.'

2. No other vocation seemed open to the old shepherd's sons than that which he himself for more than threescore years had diligently followed; and the young Alexander accordingly became a shepherd. But, as he was short-sighted, and of a feeble *physique*, he was unfitted for life on 16 hillside, and, much to his father's discontent, occupied

what time he could in reading and writing, and poring over his Old Testament histories. By degrees he acquired a reputation among his unlettered neighbours for extraordinary talent, as boys who read much and play little generally do; and a maternal uncle, who paid the family a visit in the spring of 1784, joining in the popular opinion, he offered to board him in New Galloway at his own cost, and keep him there at school. The offer was accepted. At first, the ungainly shepherd lad, with his uncouth speech and strange pronunciation, was the mock of his schoolfellows. Before the August vacation he had won their respect. By steady industry he had learned to read and write with some facility, and often he contrived to stand dux of the Bible History class.

3. He remained thus employed but three months, owing to a severe attack of illness. But at home he continued to follow out the studies he had barely opened up at school. and for five years perseveringly toiled at the acquisition of knowledge with little help from books, and none from competent instructors. It was only his scanty leisure that he could thus engage, for, as soon as he had regained sufficient strength, his father again despatched him to watch his flocks. 'About this time,' he writes, 'and for years after, I spent every sixpence that friends or strangers gave me on ballads and penny histories. I carried bundles of these in my pockets, and read them when sent to look for cattle on the banks of Loch Grennoch, and on the wild hills in its neighbourhood.' Among the uncultured inhabitants of the glen where his father's cottage was situated, his fame as a 'genius' rapidly increased, and his powers of memory excited the liveliest astonishment. used to recite, ex memoria, passages from Scripture history and snatches of old ballads blended with imaginations of his own, which strangely puzzled the honest peasants of Minnigaff.

4. About September 1787, he obtained from a friend the loan of L'Estrange's Translation of Josephus, and a book of much Dryasdust-like information, formerly well known as Salmon's Geographical Grammar. From the latter, he says, he derived immense benefit, acquiring from its pages some knowledge of geography and universal history, as well as of the nature and peculiarities of the various languages of the world. He learned to copy its maps, and in due time advanced to original sketches of that country side, of which he lived to become the boast and ornament.

It was at this period that the self-taught lad, abandoning the uncongenial pursuit which his brothers so contentedly followed up, engaged himself as teacher in the families of two neighbouring farmers, receiving for his labours his daily bread and a remuneration of about one shilling per week. This salary he mainly expended in the purchase of books. From one of these, Cocker's Arithmetic, he learned, in two or three months, the four principal rules of arithmetic, and he even advanced as far as Rule of Three, with no additional assistance except the use of an old copy-book of examples made by some boy at school, and a few verbal directions from his brother Robert. When the winter had passed, an opportunity offered of his attending school at Minnigaff for three days in the week; and be sure he made the most of those precious days. An hour before the school commenced he was at his post. All the books brought thither by his schoolfellows he contrived to find time to peruse, devoting his play-hours to this delightful occupation. He applied himself zealously to his arithmetic, and, that he might qualify himself to become a merchant's clerk, contrived to pick up some acquaintance with Hutton's system of book-keeping. He was only six or seven weeks at school. and yet he accomplished so much! But the whole soul of the earnest youth was absorbed by one sublime passion. the love of knowledge. An enemy may relax in his hatred a lover may cool in his affection, a friend grow false to his friendship; but the true student never waxes faint in the pursuit of wisdom. He feels, like Newton, that he is but a child picking up pebbles on the shore of the ocean of Truth, and he will not weary of his work, nor pause in his delightful labours.

He again attended school during the summer-time of and then first began to develope the wonderful

faculty he possessed for the acquisition of languages. He had long meditated on the specimens of the Lord's Prayer, in every language, which relieved the dreary pages of Salmon's He had learned to regard Virgil and Homer. Milton, Shakspeare, and Newton, as the most illustrious of mankind. He had been early informed by the elders of his father's church that Hebrew was the most ancient language, and had even familiarised himself with the Hebrew alphabet from the characters affixed to the different portions of the 119th Psalm in an old large-lettered psalter. He now desired to obtain some knowledge of these strange, mysterious tongues, and while at school commenced the study of French. While pursuing his novel researches, a schoolfellow, named Kerr, happened to remark that he had once learned Latin for a fortnight, but did not like it, and that he had still in his possession the Rudiments of the grammar. This was enough for Murray. The insatiable student cried, 'Do lend it to me! I wish to see what the nouns and verbs are like, and whether they resemble French.' Kerr gave him the book. 'I examined it,' says Murray, 'for four or five days, and found that the nouns had changes on the last syllable, and looked very singular. I used to repeat a lesson from the French Rudiments every forenoon in school. On the morning of the midsummer fair of Newton Stewart I set out for school, and accidentally put into my pocket the Latin Grammar instead of the French Rudiments. On an ordinary day, Mr. Cramond would have chid me for this, but on that festive morning he was mellow, and in excellent spirits—a state not good for a teacher, but always desired in him by me, for he was then very communicative. With great glee he replied, when I told him my mistake and showed him the Grammar, "Gad, Sandy, I shall try thee with Latin;" and accordingly read over to me no less than two of the declensions. It was his custom with me to permit me to get as long lessons as I pleased, and never to fetter me by joining me to a class. There was at that time in the school a class of four boys, advanced as far as the pronouns in Latin grammar. They ridiculed my separated condition; but before the vacation in August I had reached the end of the Rudiments, knew a good deal more than they, by reading at home the notes on the foot of each page, and was so greatly improved in French that I could read almost any French book at opening of it. I compared French and Latin, and riveted the words of both in my memory by this practice. When proceeding with the Latin verbs, I often sat in the school all mid-day, and pored on the first page of Robert Cooper's Greek grammar -the only one I had ever seen. He was then reading Livy, and learning Greek. By help of his book I mastered the letters; but I saw the sense of the Latin rules in a very indistinct manner. Some boy lent me an old Corderius. and a friend made me a present of Eutropius. I got a common vocabulary from my companion Kerr. I read to my teacher a number of colloquies, and before the end of July was permitted to take lessons in Eutropius. was a copy of Eutropius in the school that had a literal translation. I studied this last with great attention, and compared the English and Latin. When my lesson was prepared, I always made an excursion into the rest of every book; and my books were not, like those of other schoolboys, opened only in one place, and where the lesson lay.'

6. Thus much was accomplished in about three months. During the winter Murray earned his livelihood, as before, by teaching, but continued the vigorous prosecution of his private studies. Having obtained a few Latin books from some friends, and picked up at a book-stall an old copy of Ainsworth's Latin Dictionary, he employed every spare moment in pondering over these inestimable acquisitions. 'I literally read the dictionary throughout,' he says, 'My method was to revolve the leaves of the letter A, to notice all the principal words and their Greek synonyms, not omitting a glance at the Hebrew; to do the same by B,

A; and in these winter months I amassed a large Latin and Greek vocables. From this exercise I utropius, Ovid, and Cæsar, or at times to Ruddimmar. The inverted order often perplexed me; aently mistook, but also frequently discerned, the

sense. I got another book which, from that time, has influenced and inflamed my imagination. This was "Paradise Lost"—of which I had heard, and which I was eager to see. I cannot describe to you the ardour, or various feelings, with which I read, studied, and admired this first-rate work.'

7. In the summer of 1791, this persevering seeker after knowledge again attended school for about three months, and pursued the same course of indefatigable reading. Having introduced himself to the notice of Mr. Maitland, the clergyman of the parish, by writing letters to him in Latin and Greek, he obtained access to his library, and read, with avidity, Longinus and Homer, the Orations of Cicero, and the Œdipus Tyrannus of Sophocles, while, with the aid of Robertson's Hebrew Grammar and a Hebrew dictionary, he made himself thoroughly familiar with the Scriptural tongue. Thus, almost unaided, and in the face of apparently insuperable difficulties, the son of the Kirkcudbright shepherd had acquired a complete knowledge of French, Hebrew, Latin, and Greek, and also no slight acquaintance with the best authors in each language.

8. The year 1792 was distinguished by his extending his researches into Anglo-Saxon, Welsh, and even Abyssinian; but as yet this extraordinary man and indefatigable scholar was unknown beyond the narrow limits of Minnigaff and New Galloway, and it seemed probable that he would pass a laborious life in the cold shade of rural obscurity. introduction to a wider sphere was owing to the kindly zeal of an itinerant tea-merchant, Mr. Hay, who had long admired his learning and capacity, and made known the extent of his acquirements wherever he went. He happened to speak of Murray to Mr. James Kinnear of Edinburgh, then in the King's printing office, who immediately volunteered, if Murray would furnish him with a narrative of his early struggles, to submit it to several literary men of good repute. He kept his word, and the result was, an invitation for the shepherd-linguist to visit Edinburgh, where he was examined by the principal and several professors of the University. The extent and variety of his attainments so won their respect, that they threw open to him the different University classes, and raised a fund for his support while he attended them. In this good and charitable work, the Principal, Dr. Baird, was one of the foremost.

- 9. But Murray was soon independent of eleemosynary aid. He obtained employment as a teacher and translator, and settled in Edinburgh for the next twelve years, punctually discharging his duties and assiduously prosecuting his studies. He continued to widen his knowledge of the languages of Asia, Europe, and Africa, mastering so completely the various Ethiopic dialects that he was sclected in 1802, by the London publishers, to bring out a new edition of 'Bruce's Travels,' which he accomplished in 1805, with so much skill, care, and erudition, as at once to place himself in the foremost rank of the Oriental scholars of the nineteenth century.
- 10. He was appointed in 1806 to the church of Urr in Dumfriesshire, where he remained for six years, occupying the intervals of his pastoral labours in the composition of his colossal work on the 'History of the Languages of Europe.' In July 1812 he was elected, after a severe contest, to the Professorship of Oriental Languages in the University of Edinburgh; the Senate at the same time conferring upon him the diploma of Doctor of Divinity. entered on his duties on the 31st of October, and, though evidently failing in health, commenced the delivery of an elaborate course of lectures on the Literature of the East. which attracted and charmed enthusiastic audiences. took so keen a pleasure in his work that he was insensible to the progress of disease. But Mrs. Murray, who had been left behind at Urr, impelled by a powerful presentiment, hastened to Edinburgh, in the hope of inducing him to relax from his labours and pay some attention to his enfeebled constitution. She arrived in Edinburgh on April 13, 1813, and found her husband, encircled by his books and manuscripts, dictating to an amanuensis. But the lamp was nearly burnt out; the angel of death was already darkening on the threshold. He went to bed that

evening, to rise from it never more. In the course of twenty-four hours, this laborious and successful student had ceased to be, terminating his remarkable career in the thirtyeighth year of his age. A more signal instance of what may be effected by patient labour, unremitting industry, and determined purpose, we could scarcely place before our readers. Take the shepherd-boy, on the heathery hill-side, tending his master's herds throughout the weary day, and you would suppose that to none were there opened up fewer chances of obtaining literary distinction, or acquiring a knowledge of the abstruse tongues of the Eastern races. A faint heart, indeed, could never have conquered the obstacles that met the ardent young student at every step. But, like the French soldier who exclaimed, 'I will be a marshal, and a great general,' and died with the marshal's bâton in his grasp, Murray declared to himself, 'I will be a profound scholar, and a great linguist,' and lived to occupy the professor's chair, and to command the respect and admiration of the learned of every civilised nation.

DR. SAMUEL LEE.

1. Samuel Lee was born at Lognor, near Shrewsbury, in 1783. He received his education at a charity school, and, like many others who in after life have obtained eminence, was by no means an example of precocious talent. master, indeed, probably because he had not the discernment to hit upon Lee's peculiar bias, declared him to be one of the obtusest lads he had ever had under his charge. At the age of twelve years he was apprenticed to a carpenter, and he continued to handle the hammer and chisel until he arrived at manhood. But, finding his leisure hours hang heavily on his hands, he took to reading as an agreeable pastime, and, the appetite growing by what it fed on, he was next stimulated to master the meaning of the Latin quotations which occasionally 'bristled' in the pages he perused. He bought a Latin grammar, and learned Latin. A copy of the Greek Testament excited in him a desire to learn Greek. Selling some of his Latin books, he purchased with the proceeds a Greek grammar and lexicon. and taught himself Greek. In like manner he mastered Hebrew, and even conquered, wholly unassisted, the Chal-

dee, Syriac, and Samaritan dialects.

2. Long vigils and incessant labour had impaired his health and brought on a severe ophthalmic disease. Lee, therefore, was obliged to lay aside his books, and devote himself entirely to his pursuits as a carpenter. Punctual in his engagements, moderate in his charges, and an admirable workman, his business soon increased to such an extent as to enable him to marry; but soon afterwards he lost his chest of tools in a fire, and, being unable to provide himself with another, resolved to open a day-school for young children, as affording the readiest means of support. As a preliminary step, however, he was constrained to

teach himself reading and writing.

- 3. He opened his school, and prospered. The blamelessness of his life, the simplicity of his character, and the extent of his acquirements, raised around him many friends. and Archdeacon Corbett procured him the appointment of master of Bowdler's Foundation School at Shrewsbury. But the arduous duties of a post so responsible did not prevent him from the vigorous prosecution of his studies. and he soon acquired a thorough mastery over the principal languages of the East, as well as French, German, and Italian. In 1815, through the assistance of his generous friends, he was enabled to enter himself at Queen's College, Cambridge, where he graduated as Bachelor of Arts in 1817, and distinguished himself by the soundness of his mathematical knowledge. In 1819, he was elected Professor of Arabic to the University, and in 1821, Regius Professor of Hebrew.
- 4. His later life was devoted to the gratuitous instruction of missionaries designed to labour among the nations of the East, and to the composition of various elaborate works translations of the Scriptures into several Asiatic dialects. and a 'Hebrew, Chaldaic, and English Lexicon.' His long and laborious career was fitly closed by a tranquil death in 1850. He left behind him the legacy of a bright and

shining example to youth, of the brilliant success which rewards the energy and decision of the intrepid student, animated by a noble yearning to excel

EPILOGUE

- 1. The difference between talent and mediocrity is, perhaps, to a great extent, a question of energy. Talent implies activity; mediocrity, inertness. It is not so much the gifts with which Heaven endows us, as the use we make of those gifts, which will determine the issue of our lives. Many illustrious men have been sad dunces in their early years. Who, indeed, in the boy Walter Scott discerned any indications of the future genius of the author of 'Waverley'? Adam Clarke's father pronounced him a stupid dunce; Dean Swift was 'plucked' when he went up for a degree at Dublin University. So, too, the literati and illuminati of Edinburgh said of Dalzell, afterwards highly distinguished as an erudite Greek scholar, that 'dunce he was, and dunce he would remain; 'and Chatterton, that 'boy of marvellous pride,' was stigmatised as a fool, of whom nothing could be made. If, then, your progress should seem slow in youth, and excite the ridicule of the more precocious, bate not one jot of heart or hope. Take courage from these illustrious examples, and work with energy—with purpose—with unconquerable determination. Work and Purpose, in the long run, will outstrip Talent.
- 2. How much may be done to find a 'way' when the 'will' exists, is vividly shown in the brief but brilliant career of John Leyden. He was born at Denholm, in Roxburghshire, in 1785, the son of a shepherd, like Murray the linguist, and Hogg the poet, and at an early age evinced a passionate desire for knowledge. He was mainly self-taught; the only instruction he received being a few lessons in reading at the village schoolhouse of Kirkton, whither he walked daily across the wind-swept moorlands, some seven or eight miles. Allowing no difficulties to daunt him, he contrived, in 1790, to make his way to the University of Edinburgh, where his resolute

pursuit of knowledge, and the rapidity with which he got through enormous work, soon attracted the attention of the professors, as well as of the literary celebrities of the 'Modern Athens.' He was accustomed, it is said, to frequent a small bookshop kept by Archibald Constable (afterwards the well-known publisher), who permitted him to read what books he would; and hour after hour, the Roxburgh shepherd's son would sit, perched high upon a ladder, with some elaborate volume in his hand, in complete oblivion of the scanty fare which awaited him in his humble

lodging.

3. The college vacations were spent at home, and, as his father's cottage afforded no place for undisturbed study, he looked elsewhere for the accommodation he required. 'His chief place of retirement,' says Sir Walter Scott, 'was the small parish church, a gloomy and ancient building, generally believed in the neighbourhood to be haunted. To this chosen place of study, usually locked during week days, Leyden made entrance by means of a window, read there for many hours in the day, and deposited his books and specimens in a retired pew. It was a well-chosen spot of seclusion, for the Kirk (excepting during Divine service) is rather a place of terror to the Scottish rustic, and that of Cavers was rendered more so by many a tale of ghosts and witchcraft, of which it was the supposed scene, and to which Leyden, partly to indulge his humour, and partly to secure his retirement, contrived to make some modern additions. The nature of his abstruse studies, some specimens of natural history, as toads and adders, left exposed in their spirit-vials, and one or two practical jests played off upon the more curious of the peasantry, rendered his gloomy haunt not only venerated by the wise, but feared by the simple of the parish.'

4. Having completed his studies at Edinburgh, Leyden accepted an engagement as tutor to the εons of Mr. Campbell of Fairfield, and accompanied them to the University of St. Andrew's. While faithfully discharging his duties to his pupils, he nevertheless found time to pursue his investims into the Oriental languages and history, and published

in 1799 a 'Narrative of European Discovery in Northern and Western Africa.' In 1800 he was ordained to the Church. His poetical powers now found vent in the 'Edinburgh Magazine,' and in certain contributions to Lewis's 'Tales of Wonder,' and Scott's 'Minstrelsy of the Scottish Border.' Other literary labours widened his celebrity, and promised him a reputable position among Scottish men of letters, but his eager desire to visit foreign parts induced his friends to apply for an appointment in the Indian Civil Service. They could only procure a nomination to the post of surgeon's assistant. But Leyden knew nothing of medicine, and six months only could be allowed before he must pass his examination. Leyden's energy did not fail him. He set to work, and worked so laboriously, so zealously, and with such success, that within the allotted time he passed his examination, and obtained his diploma. He then completed and published his beautiful poem, 'The Scenes of Infancy,' and, in December 1802, bade farewell to Scotland for ever.

- 5. Upon his arrival at Madras his health gave way, and he was compelled to remove to Prince of Wales Island. He remained there for a considerable period, prosecuting a series of researches into the origin, language, and literature of the Indo-Chinese tribes, and making occasional excursions into Sumatra and the peninsula of Malacca. Shortly afterwards his genius and erudition were recognised by his appointment to a judgeship in Calcutta. With characteristic zeal, he laboured in the performance of his new duties, but still devoted every leisure moment to the study of Oriental manuscripts and antiquities. 'I may die in the attempt,' he wrote to a friend; 'but if I die without surpassing Sir William Jones a hundredfold in Oriental learning, let never a tear for me profane the eye of a Borderer.'
- 6. Leyden, in 1811, accompanied the Governor-General on a military and naval expedition to Java, rejoiced at the opportunity of adding to his stores of recondite information. It proved a fatal voyage. 'His spirit of romantic adventure,' writes Sir Walter Scott, 'led him literally to rush

upon death; for, with another volunteer who accompanie the expedition, he threw himself into the surf, in order be the first Briton of the expedition who should set for upon Java. When the success of the well-concert movements of the invaders had given them possession the town of Batavia, Leyden displayed the same ill-omen precipitation, in his haste to examine a library, or rath a warehouse of books, in which many Indian manuscrip of value were said to be deposited. A library in a Dut settlement was not, as might have been expected, in the best order. The apartment had not been regularly vent lated, and either from this circumstance, or already affect by the fatal sickness peculiar to Batavia, Leyden, when] left the place, had a fit of shivering, and declared t atmosphere was enough to give any mortal a fever. T presage was too just: he took his bed, and died in thr days (August 28, 1811), on the eve of the battle whi gave Java to the British Empire.'

He sings no more,
His bright and brief career is o'er,
And mute his tuneful strains;
'Quench'd is his lamp of varied lore,
That loved the light of song to pour:
A distant and a deadly shore
Has Leyden's cold remains.

7. From these examples, then, we may conclude the true student will never suffer himself to be thwarted any obstacles, but will rather regard them as addition incentives to renewed exertions. 'Difficulty,' said Edmu Burke, 'is a severe instructor, set over us by the supresordinance of a parental guardian and legislator, who kno us better than we know ourselves; and He loves us bett too. He that wrestles with us strengthens our nerves a sharpens our skill. Our antagonist is our helper. The amicable conflict with Difficulty obliges us to an intima acquaintance with our object, and compels us to considit in all its relations. It will not suffer us to be superficial.

CHAPTER V.

EXAMPLES AND ENCOURAGEMENTS FROM THE LIVES OF MEN EMINENT FOR COMMERCIAL ENTERPRISE, PHILANTHROPY, OR SCIENTIFIC ACQUIREMENTS.

Man is his own star, and the soul that can
Render an honest and a perfect man,
Commands all light, all influence, all fate—
Nothing to him falls early or too late.
Our acts our angels are, or good or ill,
Our fatal shadows that walk by us still.

Braumont and Fletcher,

PROLOGUE.

1. Perhaps no other country than England can offer so many examples of men whose industry and commercial enterprise have raised them to the most distinguished positions. The ancestor of the ducal family of Leeds was Osborne, the cloth-worker's apprentice, on old London Bridge. Jedediah Strutt, the founder of the Belper peerage, was a cotton-spinner. The father of the late Sir Robert Peel, and first baronet of that name, was also a magnate of the cotton trade. Lord Dudley and the Earl of Romney trace their descent from members of the Goldsmiths' Guild. The present Lord Overstone was formerly Jones Loyd the banker. Mr. W. S. Lindsay, the active Member of Parliament and wealthy shipowner, began life as a cabin boy. The late Mr. Herbert Ingram, M.P. for Boston, and proprietor of the 'Illustrated London News,'

was, at the outset of his career, an obscure news-agent. Joseph Brotherton, late Member for Salford, toiled for years as a factory boy in a cotton mill. Even while we write, baronetcies have been bestowed on several successful merchants—on William Brown, David Baxter, and others—and, indeed, to the steady perseverance of the 'lords of commerce' England delights to throw open the golden avenues to honour.

2. But in commercial pursuits, as in all others, 'strenuous individual application' is 'the price paid for distinction.' Whether a man devote himself to commerce, science, or philanthropy, Work and Purpose are the spells which charm the Goddess of Fortune. 'It is the diligent hand and head alone that maketh rich in self-culture, growth in wisdom, and in business. Even when men are born to wealth and high social position, any solid reputation which they may individually achieve is only attained by energetic application; for though an inheritance of acres may be bequeathed, an inheritance of knowledge and wisdom can-The wealthy man may pay others for doing his work for him, but it is impossible to get his thinking done for him by another, or to purchase any kind of self-culture. Indeed, the doctrine that excellence in any pursuit is to be achieved by laborious application only, holds as true in the case of the man of wealth as in that of Drew and Gifford. whose only school was a cobbler's stall, or Hugh Miller. whose only college was a Cromarty stone quarry.

3. The first Sir Robert Peel may be taken as a satisfactory example of the commercial magnates of Saxon England. He was born in 1750, near Blackburn. His father was a calico-maker, and a man of great shrewdness, energy, and perseverance, who introduced into the manufacture the process of printing the calico by machinery. He possessed, as his son declared, 'a mechanical genius and a good heart,' and, ambitious, perhaps, to found a family, he placed all his sons, as they advanced in years, so that they might assist each other, and contribute to the general prosperity. Robert, when only twenty years of age, commenced business on his own account as a cotton-

printer. The capital (500l.) with which he started was furnished by his uncle, James Haworth, William Yates, and himself; Yates contributing the larger portion of the funds, and Peel the practical knowledge and mechanical ingenuity. A few wooden sheds were run up, on a site near Bury, long known as 'The Ground,' and the partners began operations in 1770—first as cotton-printers, and afterwards as cotton-spinners. Peel lodged with Yates, who was a married man with a family, and paid him for board and lodging eight shillings and sixpence per week. Yates's eldest daughter, Ellen, a very attractive child, warmly engaged the affections of the young cotton-printer, who was wont to take her upon his knee, and say, 'Nelly, thou bonny little dear, wilt be my wife?' To which she would answer, 'Yes.' 'Very well, then, Nelly,' Peel would rejoin; 'do thou wait for me, and I'll wait for thee; I'll marry thee, and none else.' And it was even so. years passed away, and Robert Peel, become a man of wealth and credit, wedded Ellen Yates, then in her seventeenth year. She lived to be the mother of the great statesman and premier of England, and died in 1803, three years after her energetic and successful husband had received the distinction of a baronetcy.

4. The career of Sir Robert Peel may be justly characterised as one of almost unbroken success, but that success was due entirely to his indefatigable exertions. always studying what improvements might be effected in the cotton machinery, and eagerly adopted novel processes if successful, and rewarded ingenious inventors. articles produced by his firm were accordingly known by their superior excellence, and enjoyed the command of the market. But he was something more than a money-maker and a cotton manufacturer. As he rose in the world, and the distinction of a seat in Parliament became not too wild a dream, he laboured hard to conquer the disadvantages of a defective education, and by close study made himself a competent authority on every subject connected with the commercial enterprise and productive resources of England. Consequently, he was always listened to by the House of Commons with that respect which it invariably pays to a man of wound knowledge and unblemished character. He was created a baronet in 1801; and having lived to see his eldest son one of the most distinguished of rising English statesmen, and Home Secretary in the Duke of Wellington's Administration, he died peacefully in 1830, at his seat, Drayton Manor, Staffordshire, in his eightieth year, leaving to his family the legacy of an immense for-

tune and a spotless 'scutcheon.

5. But proud as Englishmen may rightly be of these merchant princes, whose lives and triumphs so powerfully illustrate the inherent energy and force of will of the Saxon race. they may with justice be prouder of the courageous philanthropists who have dared every danger, and patiently endured the extremity of suffering, to conquer some great social evil, ameliorate the condition of the oppressed, or bear God's truth, in all its sublime simplicity, to barbarisn lands. The mortal heat of the sun, the deadly cold of Arctic winters, the miasma of pestilent swamps, the foul exhalations of underground cells, the taunt and the contunnely of the sceptic, the spear and the poisoned arrow of the wavage—these are the difficulties that our missionaries and philanthropists, animated by a noble purpose, voluntarily confront, and these are the perils they endure that they may successfully carry out their work of divine love. Not, indeed, for success as the world understands it, not for the success which rewards the enterprising merchant or the brilliant scientific investigator. labour these holy men. Yet a crown is theirs whose surpassing splendour no human tongue can describe: and a Howard is amply rewarded for his toil when prison discipline is regulated upon the principles of humanity; a John Williams is happy in his life when the islanders of Raratonga worship God and believe. If you had asked the martyr of Erromanga the secret of his sublime success. he would have replied, Work and Purpose. Only a resolute unflinching will, backed up by a wonderful faculty for work, can enable our Martyns and Livingstones, our Careys and Morrisons, to endure what they do endure, and to accomplish what they do accomplish.

6. An interesting narrative of the good deeds of a man of admirable purpose has recently been furnished by the author of 'Praying and Working,' from a German source:—

John Falk was born in October 1768, in a small house near the Fish Gate of Dantzic. His father was a wigmaker-a grave, industrious, persevering man; his mother a Moravian, and 'a good manager.' Into the quiet household ruled by these tranquil spirits John Falk sprang almost like a tricksy Puck, for he was lively and restless, and apparently gifted with keen sensibilities and a quick imagination. As he grew into boyhood, he showed a passionate love of music, a dreamy relish for sweet sights and sounds, and an intense delight in tales of adventure in far-off lands. The boy, in fact, was a poet in all but the power of expression. But the senior Falk wanted his son to be an expert wig-maker rather than a rhyming visionary, and at the age of ten took him from school, placed him at the wig-block, and professed to have settled his future career in life. For it is thus that parents will ignore the natural feelings or suggestive sympathies of their children, will seek to crush out their tastes and inclinations, and when Heaven means them to be heroes, will make them tallow-chandlers!

7. Little Falk retaining all the native romance and pure poetry of his soul, did but ill at the wig-block. sequently he received many whippings, and more scoldings, and was sent to bed in the darkness, that his eager eyes might not surreptitiously glance upon a sweet fancy, or noble thought, in prose or verse. But he succeeded, at last, in obtaining permission to study the violin, and was even allowed, when his fingers were skilful enough, to play second in the choir of St. Peter's Church. He also made verses—'a fearful pastime'—only to be pursued in secret, and with fear and trembling; and occasionally, with the pence flung to him by his father's customers, was able to purchase a precious volume of Wieland, Burger, or the noble Goethe, which he took with him into some quiet corner, and eagerly devoured. Often, when the snow lay thick in the streets, he would delay upon his errands, and read by the light of a friendly lamp-post until the book fell from his frost-bitten fingers. It was a great joy for the ardent little student when a waggon relled over him, and broke his leg. Was he not confined to his bed for several weeks? And what else had he to do there but read—read—read?

- 8. As soon as he recovered, however, the old discipline was renewed. 'The real nature, indeed, struggled up within him vehemently and passionately now as he grew older. It was beaten down by a stout hazel stick. grew restless and troubled; fought with wild, wrong thoughts, as many a lad has fought; remembered his mother's stories out of the Bible; prayed, with some dim notion that it would help him; went back to his work till the struggle began again, and would have run away at length with a thoughtless sailor if the old spell of music had not been laid upon him as he passed a church door, through which the mellow organ swell rolled out upon the street, and made him think some solemn thoughts of God, and the father and mother He commanded him to honour. His father at last awakened to a perception of the fact that Falk would never become a good wig-maker, and consented to allow his son to take lessons in English, twice a week, of Mr. Drommeit, an English teacher. The success with which he pursued his studies induced his father to make another concession, and permit him to choose his own vocation in life. Falk soon learned all that the teachers of Dantzic had to teach; and the burghers of that quiet town. honestly proud of the young genius, met in council, and resolved to place him at the University of Halle. in a single room, furnished only with a bed, two chairs, and a table, he lived and laboured, until, having completed the usual curriculum, he was able to remove to Weimar. then the centre of all that was great, hopeful, and truthful in German art and literature—the focus to which were attracted all enthusiastic students—the honoured home of Goethe, Herder, and Schiller.
 - 9. As a student of great promise, Falk was warmly

received by the Weimar illuminati, and, inspired by the welcome, he plunged eagerly into literary composition, producing, in wild profusion, irregular lyrics, satirical sketches, dramatic fancies, novels, and a mysterious 'Prometheus.' But it was not as a literary man his reputation was to be assured. An even nobler work was destined for him. The purpose which had slept so long in his soul awoke at last, when the storm of Napoleon's invasion swept over the German land, and the liberties of Prussia were lost, for a time, on Jena's fatal field. When all else despaired, Falk took counsel of the Bible-believed and hoped. When, during a dreary period of nine months, 90,000 soldiers and 50,000 horses were quartered on the Duchy of Weimar, with its population of 100,000, Falk alone preserved his courage, and acted with wisdom and vigour. 'The Duke,' says Mr. Stevenson, 'made him a councillor, and hung an order on his breast. He was the good genius of the place. "There goes good Mr. Councillor," people used to say, as they saw a homely man, in an amazingly wide coat, hurrying in the early morning through the town gate. His coat would be wider, and his step slower, when he returned; for he spent the day from hamlet to hamlet, filling his capacious pockets with valuables, which the peasants trusted to him without scruple, and scarce able sometimes to totter back under his burden. "I am but one man," he would suggest, apologetically, "and I have children; but I never fear death upon the path of duty." How he laboured thus, and wrote at length to the French general, and received a company at his free disposal, and patrolled with them about the country, repressing the frightful disorders, is a singular episode, worthy of being put side by side with the contemporary adventures of Perthes at Hamburgh. Peace came at length, but like sunshine over the wreck of flood and storm. The land was desolated; those whom the war had spared were carried off by a pestilence; the way to the graveyards was marked by a continuous procession; mourning became the universal habit. In one village alone, sixty orphans wept both parents. Falk himself lost four out of six children, and buried, as he declared, th

best part of his life in the grave.'

10. At first, he almost sank under the blow; but h derived consolation from faith, and patience from hope, an found the work of his life ready to his hand, in the ver depth of this terrible desolation. The orphans of Weims came to him instinctively as to their natural protector How could he turn them from his door to hunger and t thirst? He gave them food, and he clothed them, and the pressure on his resources growing too heavy for him t bear, he went round among the charitable, and influence their hearts, until he succeeded in founding the 'Society of Friends in Need,' the first organised movement in Europ on behalf of the distressed poor. The members of thi association proposed to themselves the following objects to lend money without interest to the peasants; to mak them free donations when necessary; to assist in rebuild ing their houses; to provide shelter and maintenance fo the orphans and the sick. Falk was the life and soul the society, and his untiring energy made it a blessing t the state.

11. From orphanage his generous intellect extended i cares to vagabondage, and his heart, which pitied it afflicted, could also sympathise with the young Arabs the streets. He lovingly invited them to the special shelt he provided; fed them, clothed them, taught them, and thu in fact, established the first Reformatory. He was ridicule as a theorist, as a visionary; but he persevered. The results were such as he anticipated. Some lads, indee turned out ill; but many a brand was plucked from the burning. From the Weimar Reformatory went for youths who, in after life, attained credit and repute tradesmen, clergymen, lawyers, doctors, merchants, artist and schoolmasters. Work and Purpose—the work ar purpose of a noble mind and a loving heart—had doit all!

12. He continued this life of self-denial and self-sacr fice to the end, though we cannot pause to detail its lat incidents. But, looking at its sublime results, we me

reasonably inquire—If the world gives stars and orders, titles and estates, glory and fame, to the great soldier who destroys his thousands of thousands, what meed will it award to the philanthropist who saves to society so many precious lives? Alas! of the good so silently effected man takes but little heed. The sweet strains of love and mercy are all unheard in the bray of pompous trumpets and the clash of the battle music. Nevertheless, there is One who hath said, 'Inasmuch as ye have done it unto one of the least of these my brethren, ye have done it unto me.' And Falk, we may be sure, desired no higher recompence.

His death was as calm and tranquil as his life. He had lain for six sleepless weeks, tortured with unceasing pains. When they passed away his end was very near. A friend and former pupil arrived in time to catch the last farewell. But even then his eye was dim and his speech broken. Only those who stood around the good man's bed could hear him murmur, at intervals, 'God—popular—faith—short—Christ—end.' He died on a February evening, in 1826. Three days afterwards, the children bore him to his last resting-place 'with singing of Christian psalms;' and for epitaph remain his own quaint and simple words—

Underneath this linden tree Lies John Falk; a sinner he, Saved by Christ's blood and merey. Born upon the East Sea strand, Yet he left home, friends, and land, Led to Weimar by God's hand. When the little children round Stand beside this grassy mound, Asking, 'Who lies under ground?'—Heavenly Father, let them say, 'Thou hast taken him away; In the grave is only clay.'

We now proceed to supply a few Examples from English biography of what may be achieved by work and purpose in philanthropy, commercial enterprise, and the pursuits of science.

THE DUKE OF BRIDGEWATER.

1. Francis Egerton, Duke of Bridgewater, was born in 1736. He was the fifth and youngest son of the first duke. who died when Lord Francis was only five years old, and, all his brothers prematurely perishing, he succeeded to the dukedom at the early age of twelve. His frame was so weak, and his capacity apparently so narrow, that both his mother and nurses neglected him, as unlikely to survive his brothers, but through this very neglect, perhaps, he began to thrive amazingly, and his guardians thought him, when seventeen years old, strong enough to endure the fatigues of Continental travel. They provided him with an admirable tutor in Robert Wood, the author of some learned works on the 'Ruins of Palmyra' and the 'Ruins of Baalbec;' and it is reasonable to suppose that he derived much advantage from the instructions of a scholar so accomplished. They returned from Italy early in 1756, and the young Duke, as yet without an object in life, plunged into the whirl of fashionable dissipations, kept race-horses, rode steeple-chases, and played at skittles. He was rescued from these frivolities by an event which has often had a far less beneficial influence on a man's Having formed a passionate attachment to the beautiful Elizabeth Gunning, Duchess of Hamilton, he proposed to the young widow, and was accepted. But, certain reports affecting her sister's character having reached his ear, he peremptorily insisted that his intended bride should renounce all intimacy with her. The Duchess refused, and he immediately broke off the projected match. Instead of 'breaking his heart' under the disappointment, he sought to relieve himself by engaging in active occupation, and, retiring to his Lancashire estates, set to work in earnest to increase their value and develope their capabilities.

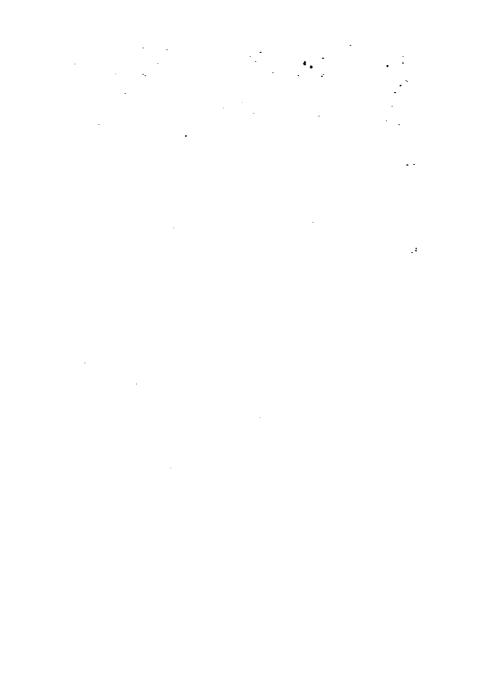
2. The first object upon which he determined was to cut a canal from his mines at Worsley to Manchester, for the purpose of obtaining a quicker and cheaper transit for his coals. By the Mersey navigation the charge for freightage was 3s. 4d. per ton, and so much time and labour were

fruitlessly expended, that the price of the coals when they reached Manchester was necessarily almost double their price at the pit-mouth. Consequently, their consumption was very limited. The young Duke resolved to cut a canal, his own canal, on which his own coals should be drawn by his own horses in his own boats. He applied to Parliament for the necessary powers, and succeeded in obtaining an Act, which received the royal assent in March 1759.

- 3. His principal agents in carrying out the extensive schemes in which he now embarked were his land steward, John Gilbert, and his engineer, James Brindley. They laboured together with hearty good will, and by their united energies triumphed over difficulties of the most formidable character. 'The Duke,' says his latest biographer, very justly, 'was possessed by a brave spirit. He had put his hand to the work, and he would not look back.' He had become thoroughly inspired by his great idea, and determined to bend his whole energies to the task of carrying it out. He was only thirty years of age—the owner of several fine mansions in different parts of the country, surrounded by noble domains. He had a fortune sufficiently ample to enable him to command the pleasures and luxuries of life, so far as money can secure them; yet all these he voluntarily denied himself, and chose to devote his time to consultation with an unlettered engineer, and his whole resources to the cutting of a canal to unite Liverpool and Manchester.
- 4. The young Duke took up his residence at Worsley Hall, dismissed his servants, denied himself every luxury but a pipe of tobacco, put down his carriages and town house, and limited the expenses of his household—a duke's household!—to 400l. per annum. To enable him to visit the works of the canal at distant points, he kept, however, a horse for himself and another for his groom. Yet, even with all this rigid economy and self-denial, his resources frequently gave way under the pressure of the heavy burden laid upon them. To construct a canal four-and-twenty miles in length, with its bridges, and aqueducts.

and tunnels, and locks, is a work of immense magnitude even for the wealth of an English duke to carry out; and often it was with the greatest difficulty that his steward, by levying small sums from his tenantry, could raise enough money to meet the Saturday's claims of his large staff of artisans and labourers. In a small public-house at Chat Moss, the Duke, Gilbert, and Brindley would occasionally meet to discuss, over their ale and tobacco, the serious question of the expenses of the works. 'One evening in particular,' we are told, 'the party was unusually dull and silent. The Duke's funds were exhausted; the canal was by no means nearly finished; his Grace's credit was at the lowest ebb; and he was at a loss what step to take next. There they sat, in the small parlour of the little publichouse, smoking their pipes, with a pitcher of ale before them, melancholy and silent. At last the Duke broke the silence by asking, in a querulous tone, "Well, Brindley, what's to be done now? How are we to get at the money for finishing this canal?" Brindley, after a few puffs, answered through the smoke, "Well, Duke, I can't tell: I only know that if the money can be got, I can finish the canal, and that it will pay well." "Ay," rejoined the Duke; "but where are we to get the money?" Brindley could only repeat what he had already said; and thus the little party remained in moody silence for some time longer, when Brindley suddenly started up, and said, "Don't mind, Duke; do n't be cast down; we are sure to succeed. after all!" The party shortly after separated, the Duke going over to Worsley to bed, to revolve in his mind the best mode of raising money to complete his all-absorbing project.'

5. The Duke finally succeeded in completing his gigantic enterprise without even mortgaging his landed property, though the total cost amounted to no less a sum than 220,000l. He was amply repaid for the outlay, and for the remarkable self-denial which he exercised through so many eventful years, by the enormously increased value of his estates. To the end of his life he took an active interest in his canals, and his mines, and his mills, closely superintending





ndley and the Duke of Bridgewater in the little Tavern at Chat Mone.

the operations of his workmen, and exacting from them that punctuality which he himself most rigidly respected. He built for them convenient cottages, and established well-regulated shops and markets, and, though so closely economical in his private habits, was liberal in everything that touched their welfare. He was also a warm patron of the benevolent institutions of the country, and when the Loyalty Fund was raised contributed the regal donation of 100,000%.

6. 'In person,' we are told, 'he was large and corpulent, and the slim youth on whom the bet had been laid that he would be blown off his horse when riding a race in Trentham Park, grew into a bulky and unwieldy man. His features strikingly resembled those of George III. and other members of the royal family. He dressed carelessly, and usually wore a suit of brown—something of the cut of Dr. Johnson's—with dark drab breeches, fastened at the knee with silver buckles. At dinner he rejected, with a kind of antipathy, all poultry, veal, and such like, calling them 'white meats,' and wondered that everybody, like himself, did not prefer the brown. He was a great smoker, and smoked far more than he talked. Smoking was his principal evening's occupation when Brindley and Gilbert were pondering with him over the difficulty of raising funds to complete the navigation; and the Duke continued his solitary enjoyment through life. One of the droll habits to which he was addicted was that of rushing out of the room every five minutes, with the pipe in his mouth, to look at the barometer. Out of doors he snuffed, and he would pull huge pinches out of his right waistcoat pocket and thrust the powder up his nose, accompanying the operation with sundry strong short snorts.'

7. The Duke died in 1803, leaving behind him a strong claim to the gratitude of his countrymen, for he may be justly said to have laid the foundations of the surprising manufacturing prosperity of Lancashire, which has so largely contributed to augment the wealth, resources, and influence of the British empire. His career is a remarkable instance of what may be accomplished by a man who, working always with an unwavering purpose, absorbs him

entire powers in the achievement of one notable end. Lancashire has since produced many illustrious examples of successful commercial enterprise; but in none has been more signally displayed that combination of boldness, firmness, sagacity, and the faculty of work which is nowadays popularly understood to distinguish the 'Manchester man.'

JONAS HANWAY.

1. This enterprising merchant and noble philanthropist was born at Portsmouth, in 1712. His father perishing by an accident in the dockyard, when he was of tender years, his mother removed to London, and by dint of hard work and hard living contrived to educate her children respectably, and fit them, by the constant lessons of her example, to lead honourable and virtuous careers. At the age of seventeen Jonas obtained, through the kind offices of a friend, a position in a merchant's office at Lisbon, where he remained for many years, distinguishing himself by his habit of punctuality and fidelity to engagements, and amassing, by well-directed exertions and the exercise of a prudent economy, a moderate fortune. He was thus enabled, in 1743, soon after his return to England, to enter into partnership with an important firm at St. Petersburg, whose principal operations related to the Caspian trade. He set out for Russia to extend these operations; and, discovering that this could not safely be effected unless he first visited the chief seats of the trade, he ventured on a journey into Persia, then an undertaking of no ordinary After encountering bands of robbers, and surviving the dangers of an insurrection which broke out during his stay at Astrabad, he reached Ghilan in safety, disposed at a profit of the English cloth he and his party had successfully carried so far, expended the receipts in the purchase of Persian silk, and returned to St. Petersburg, where he soon got rid of his silk, and netted a satisfactory receipt He remained in the capital of the Czars for five years, but, having accumulated a fortune sufficient for his desires, he returned to England in 1750, setting before himself the

noble object of 'doing as much good to himself and others as he was able.'

- 2. His fortune was not a large one, but, as he lived in a style of extreme frugality, it proved sufficient, wisely laid out, to effect a vast amount of good. The principal labours of his later life we can but briefly notice. He first took up the question of the condition of the metropolitan streets. We who now pass with such facility along the well-paved and well-lighted highways can form no conception of the miseries which our ancestors contentedly, or, at least, silently, endured. If two persons attempted to pass one another, one was sure to be jostled into the kennel. The traveller's head was endangered by the ugly projections which extended over almost every shop, and his attire by the dirty water which streamed from the housetops after every shower. By continual action, by speaking much and writing much, Hanway at length formed a powerful party, which forced from Parliament an inquiry into, followed by a vigorous improvement of, the condition of the streets of London.
- 3. The next subject which attracted the attention of this indefatigable man was the improvement of the merchant service, from which the royal navy was supplied with able seamen. He laboured long at this national object, but met with no response from those most interested in it. At last, he contrived to assemble a number of influential merchants and shipowners at the Royal Exchange, and urged upon them so impressively the advantages which must result to the country from the improved training of its marine, that they gladly cooperated in the establishment of a society for educating landsmen, volunteers, and boys for the royal navy. He found a powerful coadjutor in the active magistrate Sir John Fielding; and the result of their united labours was. the Marine Society, now in the one-hundred-and-seventh year of its existence. A number of poor boys were sent, in 1756, on board the line-of-battle ship 'Honfleur;' and by the close of the year 1763, 5,451 boys and 4,787 landsmen were added to the navy, or the East India service, at the expense of this society. About 540 boys

are still drafted every year on board the Queen's ships, or into our commercial marine; and the whole number of boys supplied from 1756 to the close of the year 1859 was

52,971, besides nearly 40,000 landsmen.

4. The 'Magdalen Society' also owes its successful establishment to the enlightened views and resistless energy of this heroic worker (A.D. 1758), who had to contend with the false morality of a narrow-minded and illiberal age, but, believing in the saving efficacy of tender pity and indulgent charity, steadily persevered until he had accomplished his philanthropic object. As a Governor of the Foundling Hospital, he introduced very necessary reforms into the administration of Captain Coram's admirable institution; and it may be noted, as a proof of the determination of his character, that he was the first man who, in the face of unbounded ridicule, carried an umbrella in the streets of London. As a Commissioner of the Navy Victualling Board, he did his work with the same energy and force of will: and it should be recorded to his honour, that he would never accept a gratuity from any contractor, or, indeed, any person who was engaged in business with his office. The movement in favour of Sunday Schools which Thomas Raikes had set on foot found in him an able and laborious supporter; and he also actively bestirred himself on behalf of the poor chimney-sweepers. No good work ever lacked his help and was denied it. To be oppressed, or afflicted, was a claim upon his generous heart and large brain which he was always eager to acknowledge.

5. The condition of the children of parish paupers was a subject which engaged his attention for many years, and, in the course of his investigations, he visited every workhouse in London and its suburbs, and travelled through France and Holland to examine the institutions there supported by the State. His exposure of the English workhouses was as unsparing as it was courageous, and his statements of the excessive mortality among the young that prevailed in every one of them produced such an effect on the public mind as to necessitate immediate Parliamentary action. Yet the Act of Parliament, passed in the seventh

year of the reign of George III., was obtained, after all, at his own expense. It is still in beneficial operation, and provides that all parish infants belonging to the metropolitan parishes shall be put out to nurse, in suitable buildings and under proper regulations, at a distance of not less than six miles from town.

6. The literary labours of Jonas Hanway include an account of his journey to Persia, 'Domestic Happiness Promoted,' and various other works of a religious character. They are not without the merits of propriety of thought and simplicity of style, but possess no special claims upon the reading public of the present day. His name is, indeed, one of those which the world will not willingly let die; but it is not as the mediocre man of letters, it is as the zealous, self-denying, indefatigable philanthropist, that Jonas Hanway will be remembered.

7. Thus was this good man engaged in good works up to the very close of his pure and stainless life. When, at the ripe age of seventy-four, he found his end approaching, he made ready for the great change with serene composure. He paid all his debts, settled every worldly transaction, and then peacefully laid himself down to die. With the word 'Christ' upon his lips, he passed into that heaven of which he was surely worthy.

He died in 1786, aged seventy-four. A monument was justly erected to his memory, and his dust deposited—where sleep so many of England's worthies—in Westminster Abbey. But more durable than stone or marble is the influence of his boundless charities and wisely regulated benevolence.

Exegit monumentum ære perennius.

SIR HUMPHRY DAVY.

1. SIR HUMPHRY DAVY was born at Penzance, in Cornwall, in 1778. His father was a carver in wood, and a man of ability and excellent character. He gave his son as good an education as he could afford, placing him at Dr. Carthew's boarding-school in Truro, from whence he was

removed to serve an apprenticeship to a surgeon in But the youthful Davy showed no great liking for his profession, and spent his time in rambles in the neighbouring country, or in chemical experiments in his master's garret-experiments which sometimes threatened the destruction of the experimentalist, and of the house wherein they were conducted. His apparatus, like his laboratory, was of the rudest possible description, pots and pans being pressed into his service, and his air-pump fashioned out of a glyster instrument which had been presented to him by the surgeon of a French vessel wrecked off the Land's End. At school he was noted for his apparent dulness. and his master could not discern any bright promise of the genius by which he was afterwards distinguished; but as he advanced towards manhood he himself became conscious of the possession of no ordinary powers, and would sav. 'I have neither riches, nor power, nor birth, to recommend me; yet, if I live, I trust I shall not be of less service to mankind and my friends than if I had been born with all these advantages.' The course of study he was following out he himself had arranged, and such was his methodical perseverance that, by the age of eighteen, he had obtained a thorough knowledge of the rudiments of natural philosophy and chemistry, botany, anatomy, and geometry. But the science which he most loved, and for whose successful pursuit he was best fitted by the peculiar character of his mind, was chemistry; and he seems, at a comparatively early age, to have felt that he would attain distinction in this particular channel of inquiry.

2. At first the young chemist pursued his studies without the assistance of any competent instructor, and consequently the simplest experiments would often cost him hours of laborious patience. But, becoming acquainted with Mr. Gregory Watt, the son of the inventor of the steam engine, his researches were directed to the proper objects, and he received suggestions which cleared away many of his most wearisome difficulties. His extraordinary merits attracted the patronage of Davies Gilbert, afterwards President of the Royal Society, who placed at his disposal

a valuable library, and afterwards introduced him to Dr. Beddoes of Bristol, a scientific philosopher of considerable repute. The doctor had just established in the City of the Severn a novel 'Pneumatic Institution,' for experiments on the properties and value of the different gases, and, interested by Davy's original views and sound judgment, he pressed him to undertake its entire superintendence. Thus, at the age of twenty, 'Work' and 'Purpose' had placed the apothecary's apprentice beyond the reach of worldly discouragements, and opened to him an honourable and meritorious career.

- 3. The results of the experiments which Davy now undertook, and felicitously carried out, he published, in 1799, under the title of 'Chemical and Philosophical Researches, chiefly concerning Nitrous Oxide and its Respiration.' In this interesting volume he first made known the peculiar properties of laughing gas, and, his discovery attracting the attention and admiration of the scientific world, he was invited to fill the Professorship of Chemistry at the newly-established Royal Institution. And this at the age of only twenty-two! His lectures immediately drew large and enthusiastic audiences, who were charmed by the lucidity of his expositions and the felicity of his style. In 1801 he was appointed Professor of Chemistry to the Board of Agriculture, and the lectures which, in this new position, he delivered for ten successive years, met with an equal success. They were published in 1813, at the request of the Board.
- 4. Davy was elected, in 1803, a Fellow of the Royal Society, to whose 'Transactions' he contributed many papers of singular interest and high value. In 1812, he was knighted by the Prince Regent, being the first person who received that honour at his hands, and two days afterwards he married a lady who brought him a goodly fortune. In 1818, he was created a baronet, and in 1820, unanimously elected to the Presidency of the Royal Society, a position which he filled until obliged by ill-health to retire, in 1827. Immediately after freeing himself from official trammels he proceeded to the Continent, still continuing himself.

chemical researches, and occupying his leisure with the composition of his 'Salmonia' and 'Consolations in Travel,' books which showed that his laborious scientific pursuits had not prevented him from being a close and accurate observer of Nature. But his brilliant career was nearly run. He expired of apoplexy, at Geneva, on May 28, 1829, at the comparatively early age of fifty-one.

- 5. Yes; in the very prime of intellectual manhood; and yet how much had he accomplished in his brief life! How signal a success had crowned the earnest spirit and resolute purpose in which he had lived and toiled! Almost before he was twenty-one-so well-directed and so assiduous had been his studies—he had gained a distinguished position among the experimental chemists of England, while at twenty-two enraptured audiences hung upon his lips. is not to be doubted but that this remarkable success was mainly owing to the fact that, like almost all illustrious men, he chose for himself one favourite path of thought and action, and in it persevered. Yet he was no empty sciolist or narrow-minded bigot. He was no man of 'one idea.' Beyond the bounds of chemical science his knowledge was as extensive as it was various, and the discoverer of 'laughing gas' was an admirable adept at 'fly-fishing'!
- 6. 'Every subject in Davy's mind,' said Coleridge, 'has the principle of vitality. Living thoughts spring up like turf under his feet. There is an energy and elasticity in his mind which enables him to seize on and analyse all questions, pushing them to their legitimate consequences.' The additions which he made, in thirty years, to our scientific knowledge, illustrate the power of his intellect as well as the force of his industry. The various combinations of oxygen and nitrogen, so diverse from their union in the atmosphere; the chemical changes which metals undergo in the production of galvanic influence; the foundations of a new science, that of electro-chemistry; the decomposition of alkalis by means of galvanism; the discovery of potassium and sodium; and the invention of the celebrated

ty-lamp—these are the claims of the Penzance apothes apprentice upon the admiring gratitude of posterity;

and these are claims which the world will acknowledge when the glories of victorious battle-fields are utterly forgotten.

CONCLUSION.

1. It is a remarkable illustration of the fact that, in art, science, or literature, an Elisha invariably springs up to wear the mantle just fallen from Elijah's shoulders, that the present Professor of Chemistry at the Royal Institution, Michael Faraday, derived from Davy the inspiration of his fine and philosophic genius. Faraday (born in 1794) was the son of a poor blacksmith; received but the rudiments of a meagre education; was apprenticed to a bookbinder, and remained confined to the trade until he had reached his twenty-second year. A love of chemical science, however, had already manifested itself; and with an old bottle, and similar rude materials, he had contrived an electrical machine, which worked successfully. To this, and other scientific ingenuities, his master, on one occasion, called the attention of a customer named Dance, who, surprised at the lad's attainments, and admiring his perseverance, took him to hear the last four lectures delivered at the Royal Institution by Sir Humphry Davy. 'I took notes,' says Faraday, in a letter to Dr. Paris, 'and afterwards wrote them out more fairly in a quarto volume. My desire to escape from trade, which I thought vicious and selfish, and to enter into the service of science, which I imagined made its pursuers amiable and liberal, induced me at last to take the bold and simple step of writing to Sir Humphry Davy, expressing my wishes, and a hope that, if an opportunity came in his way, he would favour my views. At the same time, I sent the notes I had taken at his lectures.' Sir Humphry replied in kind and encouraging words: and early in the following year (1813) sent for his young correspondent, informing him that the situation of assistant in the Laboratory of the Royal Institution was vacant. 'At the same time,' says Faraday, 'that he thus gratified my desires as to scientific employment, he still advised me not to give up the prospects I had before me, telling me that science was a harsh mistress, and, in a pecuniary point of view, but poorly rewarding those who devoted themselves to her service. He smiled at my notion of the superior moral feeling of philosophic men, and said he would leave me to the experience of a few years to set me right on the matter. Finally, through his good efforts, I went to the Royal Institution, early in March 1813, as assistant in the Laboratory; and early in October of the same year went with him abroad, as his assistant in experiments and in writing.'

2. Faraday returned to his post in the Institution in 1815, to succeed, in due time (1834), to Sir Humphry's professorial chair. His reputation is world-wide as a lecturer of singular eloquence, as a philosopher of the subtlest powers of analysis, and the most astonishing originality of conception. 'Meanwhile,' says Mr. Craik. 'his splendid discoveries in electrical chemistry and the contiguous regions of physical science-and the singular combination, in all his views and speculations and methods of procedure, of the most patient vigilance in examination, and the most self-denying caution in forming his conclusions, with the highest originality and boldness-have placed him, by universal recognition, in the first rank of the modern cultivators of physical science. But all this renown has changed nothing of the noble and beautiful nature of the man. It is impossible even for a stranger. seeing him only in public, not to be attracted and charmed by the unsophisticated simplicity and sunny brightness of his whole demeanour; and he is as much the object of affectionate regard with all who know him in private life as he is the pride of his country and the admiration of the whole scientific world.'

3. But a score of volumes of ampler dimensions than the present might easily be filled with examples of men who have attained eminence or excellence by working with purpose, by adopting one favourite pursuit, and concenting all their powers upon its successful development sleon boasted that to every man of talent he had

thrown open a career; but neither talent nor genius, neither brilliancy of imagination nor accuracy of judgment, can supply the place of resolute perseverance. A purposeless man is blown to and fro by the passing gusts of every fancy. However stately the ship and smooth the waters, disaster awaits her, unless a steady hand is at the helm. Let the young student, then, take heed of the examples presented in these pages, and, from the outset, choose a special path in life, to be followed up with all his heart and soul and mind and strength. Let him toil — with a purpose—and he will find his reward in the infinite pleasure such toil must necessarily originate. Let him remember that work is the manifest destiny of the human mind, and the object and fulfilment of a good man's life; ever keeping before him, as his rule of conduct, the fine old monkish homily, Laborare est orare!—'Work is Prayer!'



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